Vol. 898 Number 5

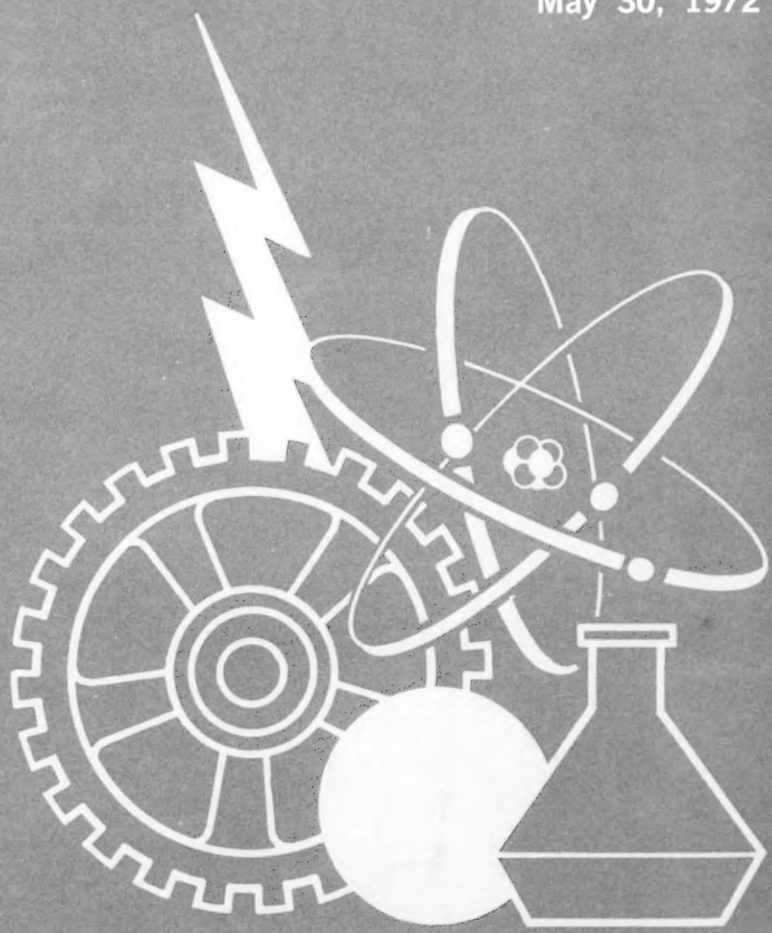
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

May 30, 1972



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

May 30, 1972 Volume 898 Number 5

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PATENT OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of April 1972

Examiner affirmed	115
Examiner affirmed in part	16
Examiner reversed	15
Total	146

Rule 283

Testimony Taken in Another Interference or Action

A discovery proceeding under the control of a U.S. District Court, ancillary to an interference proceeding, is now considered to be an "action" within the meaning of Rule 283. Accordingly, "pretrial depositions" taken in a discovery proceeding in accordance with the Federal Rules of Civil Procedure and under court control may be used in the interference as to which the discovery proceeding is ancillary, subject to all other provisions of Rule 283.

RICHARD A. WAHL,
May 2, 1972. *Assistant Commissioner.*

Service of Court Papers on Commissioner of Patents

Those having occasion to serve on the Commissioner of Patents papers having to do with court proceedings are hereby reminded that proper service by mail may be effected only by mailing the papers to the Solicitor of the Patent Office as counsel for the Commissioner. Rule 5(b) of the Federal Rules of Civil Procedure provides in pertinent part:

> Whenever under these rules service is required or permitted to be made upon a party represented by an attorney the service shall be made upon the attorney unless service upon the party himself is ordered by the court. Service upon the attorney * * * shall be made by delivering a copy to him or by mailing it to him at his last known address * * *.

Rule 25(b) of the Federal Rules of Appellate Procedure similarly provides, "Service on a party represented by counsel shall be made on counsel." The clerk of the U.S. Court of Customs and Patent Appeals has stated that, inasmuch as the rules of the Court are not specific on the manner of service in patent cases, the procedure outlined herein has the Court's approval.

Accordingly, all service copies of papers filed in court proceedings in which the Commissioner of Patents is a party which are served by mail should be addressed:

"(Name of Solicitor), Solicitor
U.S. Patent Office
Washington, D.C. 20231."

S. WM. COCHRAN,
Apr. 28, 1972. *Solicitor.*

United States District Court for the District of Columbia

RIPPLE TWIST MILLS, INC., Plaintiff
v.
INDUSTRIAL KNITTING CORPORATION, Defendant

Civil Action No. 791—72

ORDER OF PUBLICATION ON ABSENT DEFENDANT IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

The object of this suit under the Patent Laws of The United States is to secure (1) an adjudication of invalidity of United States Letters Patent 3,513,668 granted May 26, 1970, (2) preliminary and permanent injunction against Defendant, its agents, servants, employees and attorneys enjoining them and each of them from asserting or threatening to assert the aforesaid Letters Patent against customers or potential customers of Plaintiff and restraining them and each of them from filing or prosecuting any civil action or action against Plaintiff and/or its customers for infringement of said Letters Patent, (3) costs and attorneys fees, and (4) such other and further relief as may to this Court appear to be just and equitable.

On motion of the Plaintiff, it is this 27th day of April 1972, ordered that the Defendant, INDUSTRIAL KNITTING CORPORATION, a Canadian corporation having a principal place of business at 500 Sauve Street W, Montreal, Quebec, Canada, cause its appearance to be entered herein on or before the fortieth day exclusive of Sundays and legal holidays, occurring after the day of the first publication of this order; otherwise the cause will be proceeded with as in case of default.

WILLIAM B. BRYANT,
Judge.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,050,063, M. E. Margraf, PINLESS BABY DIAPER, **filed** Dec. 30, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c3146, *Mildred E. Margraf* v. *Montgomery Ward and Co. et al.*

3,129,927, A. D. Mast, MIXING APPARATUS FOR FLUENT MATERIAL, **filed** Apr. 14, 1971, D.C., E.D. Pa. (Philadelphia), Doc. 71–878, *Feedmobile, Inc.* v. *Jacob F. Conrad, trading as Eastern Mobile Mills.* Consent judgment, plaintiff's patent is valid and has been infringed. Defendants permanently enjoined, Jan. 11, 1972.

3,149,431, M. B. Blish, SELF-ALIGNING NECK CARD LABEL, **filed** Feb. 16, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c424, *Matthew B. Blish* v. *Colgate-Palmolive Co.* On stipulation, complaint and counterclaim are hereby dismissed, Oct. 14, 1971.

3,160,321, C. B. Cochran, CONTROL SYSTEM, **filed** Apr. 21, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c848, *Eagle Iron Works* v. *Barber-Greene Company.* Consent judgment for plaintiff against defendant restraining defendant, July 30, 1971.

3,173,583, E. A. Wahl, BIN ACTIVATOR, **filed** June 3, 1971, D.C.N.J. (Newark), Doc. 817–71, *Eugene A. Wahl and Vibra Screw Feeders, Inc.* v. *Chemical Construction Corporation and Willis & Paul, Inc.* Stipulation and order of dismissal, Jan. 12, 1972.

3,182,164, R. Ironfield, ELECTROMAGNETIC ENERGY SEAL, **filed** Feb. 10, 1971, D.C., N.D. Ohio (Cleveland), Doc. C–71–131, *Raytheon Company* v. *Tappan Company.* Stipulation and order dismissing action with prejudice, Jan. 11, 1972.

3,212,062, Goldman and Katz, CHECK AUTHORIZATION SYSTEM, **filed** Apr. 14, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c806, *Telecredit, Inc.* v. *Insta-Check, Inc.* Order on stipulation dismissing amended and supplemental complaint, May 13, 1971.

3,249,026, Curlett and Gurries, CONSTRUCTION MACHINES, **filed** Jan. 13, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c106, *CMI Corporation* v. *Lakeland Construction Co. et al.*

3,266,178, G. H. Sheridan, TRAINING APPARATUS, **filed** Oct. 8, 1971, D.C., N.D. Ind. (South Bend), Doc. 71S160, *The Singer Company* v. *Visual Educom, Inc. and Electronic Associates, Inc.*

3,272,397, S. G. Bean, FEEDER OF NON-FLOWING MATERIAL, **filed** Feb. 3, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c322, *Food Packaging, Inc.* v. *U.S. Sugar Company, Inc., Frank E. Greene & Sons, Inc. and Continental Sugar Company, Inc.* Cause dismissed against defendant Frank E. Greene & Sons, Inc. without prejudice, Jan. 11, 1972.

3,322,515, Dittrich and Shepard, FLAME SPRAYING EXOTHERMICALLY REACTING INTERMETALLIC COMPOUND FORMING COMPOSITES, **filed** Jan. 17, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c126, *Metco, Inc.* v. *Metallizing Company of America.*

3,330,406, R. H. Taub, COLLAPSIBLE DISPLAY BIN, **filed** Apr. 20, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c941, *Charles Kirshbaum and Ethel Taub* v. *GTE Sylvania Inc.* Order, cause dismissed with prejudice, July 28, 1971.

3,365,233, Uyeda and Fujioka, STACKING CHAIRS, **filed** Jan. 7, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–42–RJK, *Samsonite Corporation* v. *McDowell-Craig Chair Co.*

3,385,649, C. M. Hicks, CANDLE PACKAGE AND METHOD OF MAKING CANDLE, **filed** Mar. 16, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c665, *Charles M. Hicks* v. *Chicago Candle Corporation.* Enter consent judgment, July 30, 1971.

3,426,580, F. J. Callahan, Jr., METHOD OF TESTING JOINTS IN PRESSURIZED FLUID LINES, **filed** Jan. 11, 1972, D.C. Minn. (Minneapolis), Doc. 4–72–C–20, *Nupro Company* v. *Guy Speaker Co., Inc., doing business as Fluid Products Co., also known as Guy Speaker Process Accessories Co., and Guy Speaker.*

3,512,807, H. J. Moran, MANIFOLD FOR INFLATABLE LIFE PRESERVERS AND THE LIKE, **filed** Oct. 27, 1970, D.C.N.J. (Newark), Doc. 1446–70, *Switlik Parachute Company, Inc.* v. *Halkey-Roberts Corporation.* Order of dismissal filed Jan. 19, 1972.

3,517,254, A. C. McNamara, Jr., CONTINUOUS LIGHTING SYSTEM FOR GASEOUS-DISCHARGE LAMPS WITH INCANDESCENT LIGHTS FOR STANDBY, **filed** Dec. 29, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c3128, *Esquire, Inc.* v. *Thomas Ind. Inc. and Litton Ind. Inc.*

3,521,550, Van Doorn, Pease, Colquett, Tinkler and Huguley, BALE STRAPPING APPARATUS, **filed** Jan. 12, 1972, D.C., E.D. Tex. (Sherman), Doc. 2043, *Lummus Industries, Inc.* v. *Hardwicke-Etter Company.*

Errata

On page 1205, second paragraph of the OFFICIAL GAZETTE, vol. 893, issued Dec. 28, 1971, reference to existing consent decision concerning Patent Number 3,293,663 was in error. Litigation of infringement of the Cronin Patent No. 3,293,663, is still pending.

Same paragraph, second line, "3,257,688" should be *3,257,668.*

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,381,402, T. Ohfuji, PHOTOGRAPH MOUNTS AND METHOD FOR PRODUCING THE SAME, decided Jan. 4, 1972, Interference No. 97,031, claim 1.

Patent No. 3,353,739, F. J. Schay, CONTAINER MEANS HAVING PULL-OFF WALL MEANS, decided Nov. 29, 1971, Interference No. 97,003, claims 1, 7 and 8.

Patent No. 3,366,640, M. H. Sherlock and N. Sperber, ANILINO NICOTINIC ACID DERIVATIVES, decided Mar. 31, 1972, Interference No. 97,399, claims 1, 2 and 3.

Patent No. 3,471,465, G. Loew, PREPARATION OF CELLULAR POLYURETHANES IN THE PRESENCE OF TRIETHYLENE DIAMINE AND A SILOXANE-OXYALKYLENE BLOCK POLYMER, decided Mar. 30, 1972, Interference No. 97,507, claims 1–10.

Patent No. 3,514,715, W. F. Kosonocky, MULTILAYER, LIGHT-EMITTING SEMICONDUCTOR DEVICE, decided Mar. 31, 1972, Interference No. 97,672, claim 8.

Design Patent No. 214,108, R. Sulzberger, DISPLAY CABINET FOR EYEGLASS FRAMES OR THE LIKE, decided Sept. 28, 1971, Interference No. 96,990, sole claim.

Certificates of Correction for the Week of May 30, 1972

Re. 27,253	3,563,926	3,587,293	3,598,704
D. 214,555	3,567,190	3,588,283	3,598,934
D. 220,931	3,567,423	3,589,132	3,599,358
D. 222,786	3,567,836	3,589,221	3,599,677
2,914,193	3,568,153	3,589,733	3,599,765
3,308,916	3,569,860	3,589,831.	3,601,152
3,357,363	3,571,548	3,590,182	3,601,252
3,384,029	3,571,680	3,591,092	3,603,348
3,407,255	3,575,526	3,591,362	3,603,399
3,450,436	3,576,146	3,592,216	3,604,267
3,480,136	3,576,821	3,592,218	3,604,508
3,504,828	3,576,855	3,592,490	3,604,850
3,510,378	3,576,873	3,593,144	3,607,042
3,513,114	3,577,024	3,593,312	3,607,232
3,516,788	3,577,640	3,593,346	3,607,397
3,523,115	3,582,364	3,593,427	3,608,385
3,532,711	3,585,181	3,594,186	3,608,728
3,539,361	3,585,274	3,595,242	3,610,004
3,543,622	3,585,288	3,595,272	3,610,943
3,545,499	3,585,797	3,595,446	3,611,434
3,547,297	3,586,113	3,595,716	3,612,681
3,547,825	3,586,438	3,595,880	3,612,696
3,551,885	3,586,922	3,596,665	3,614,276
3,552,694	3,587,274	3,596,752	3,614,473
3,614,550	3,621,101	3,627,189	3,632,630
3,614,650	3,621,127	3,627,388	3,632,654
3,614,812	3,621,256	3,627,416	3,632,716
3,614,888	3,621,307	3,627,527	3,632,769
3,615,177	3,621,528	3,627,555	3,632,788
3,615,291	3,621,679	3,627,573	3,632,789
3,615,537	3,622,221	3,627,574	3,632,903
3,615,941	3,622,456	3,627,614	3,633,098
3,616,220	3,622,462	3,627,752	3,633,214
3,616,239	3,622,659	3,627,810	3,633,255
3,616,424	3,622,675	3,627,833	3,633,353
3,616,697	3,622,709	3,627,855	3,633,371
3,617,052	3,622,843	3,628,027	3,633,540
3,617,170	3,622,883	3,628,057	3,633,578
3,617,221	3,623,093	3,628,060	3,633,921
3,617,319	3,623,366	3,628,468	3,633,954
3,617,373	3,623,433	3,628,472	3,634,080
3,617,378	3,623,590	3,628,519	3,634,104
3,617,532	3,623,817	3,628,524	3,634,120
3,617,536	3,623,978	3,628,753	3,634,230
3,617,548	3,624,002	3,628,944	3,634,306
3,617,643	3,624,033	3,629,027	3,634,364
3,617,666	3,624,057	3,629,296	3,634,406
3,617,767	3,624,100	3,629,431	3,634,562
3,617,802	3,624,126	3,629,434	3,634,709
3,617,855	3,624,127	3,629,501	3,634,714
3,617,911	3,624,153	3,629,618	3,635,090
3,617,923	3,624,283	3,629,619	3,635,292
3,617,939	3,624,315	3,629,633	3,635,372
3,617,955	3,624,378	3,629,739	3,635,429
3,618,285	3,624,554	3,629,954	3,635,567
3,618,573	3,624,590	3,630,368	3,635,866
3,618,793	3,624,703	3,630,472	3,635,884
3,619,056	3,624,773	3,630,596	3,636,091
3,619,078	3,625,054	3,630,676	3,636,394
3,619,080	3,625,068	3,630,880	3,637,564
3,619,165	3,625,164	3,630,966	3,637,585
3,619,399	3,625,376	3,630,989	3,637,795
3,619,418	3,625,534	3,630,999	3,638,394
3,619,691	3,625,655	3,631,020	3,638,443
3,620,335	3,625,718	3,631,070	3,638,466
3,620,646	3,625,797	3,631,140	3,638,667
3,620,708	3,625,815	3,631,155	3,638,737
3,620,709	3,625,855	3,631,169	3,638,951
3,620,726	3,625,964	3,631,223	3,640,442
3,620,918	3,625,968	3,631,261	3,641,059
3,620,964	3,626,004	3,631,589	3,641,101
3,620,985	3,626,184	3,631,666	3,641,421
3,621,005	3,626,190	3,631,782	3,642,005
3,621,006	3,626,270	3,631,839	3,642,558
3,621,012	3,626,299	3,631,973	3,643,542
3,621,032	3,626,486	3,632,042	3,644,634
3,621,035	3,626,588	3,632,363	3,646,975
3,621,059	3,626,843	3,632,376	
3,621,072	3,627,046	3,632,457	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 16, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-18-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-03-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	3-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-09-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	9-21-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-12-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-19-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	3-01-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-19-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	3-23-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	3-01-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-12-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	5-21-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	3-18-71

Expiration of patents: The patents within the range of numbers indicated below expire during June 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 600, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,709,808 to 2,712,130, inclusive
Plant Patents..... Numbers 1,396 to 1,403, inclusive

REISSUES

MAY 30, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,375

IMAGE RECEPTOR SHEETS CONTAINING ORGANIC SILVER SALTS AND METAL ION IMAGE

Gerhard W. R. Puerckhauer, St. Paul, Burt K. Sagawa, Minneapolis, and Bruce W. Wittnebel, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Original No. 3,460,946, dated Aug. 12, 1969, Ser. No. 524,843, Feb. 3, 1966. Application for reissue July 20, 1970, Ser. No. 56,641

Int. Cl. G03c *1/02*

U.S. Cl. 96—94 13 Claims

Metal ion image amplifiers, such as stannous stearate, are added to image [receptor] sheets containing organic silver salts *and reducing agents,* to provide improved image appearance and to conserve silver.

27,376

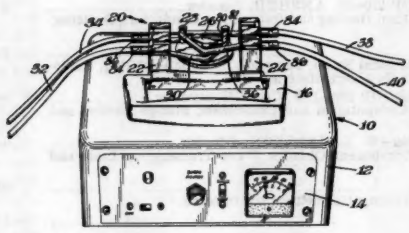
ROLLER PUMP HEADS

Robert E. Pickup, Norristown, Pa., assignor to Extracorporeal Medical Specialties, Inc.

Original No. 3,502,034, dated Mar. 24, 1970, Ser. No. 735,935, Aug. 20, 1968. Application for reissue Oct. 7, 1970, Ser. No. 78,726

Int. Cl. F04b *43/08, 43/12, 45/06*

U.S. Cl. 417—477 10 Claims



A roller pump of the type having one or more flexible tubular pumping chambers continuously and successively depressed uni-directionally by traveling pumping members wherein improved head arrangements are provided to facilitate replacement of the pumping tubes and removal of the pumping member rotor.

27,377

SYNTHESIS OF UREA

Eiji Otsuka, Fujisawa, and Toyoyasu Saida, Omiya, Japan, assignors to Mitsui Toatsu Chemicals Incorporated

Original No. 3,303,215, dated Feb. 7, 1967, Ser. No. 256,035, Feb. 4, 1963. Application for reissue Mar. 20, 1968, Ser. No. 719,784

Claims priority, application Japan, Mar. 9, 1962, 37/8,558

Int. Cl. C07c *127/00*

U.S. Cl. 260—555 A 11 Claims

A process for making urea wherein carbon dioxide is removed from a raw material gas containing N_2, H_2 and CO_2 by reacting it with ammonia to produce urea and a combined process for making urea and ammonia wherein the above-mentioned process is carried out and the resulting raw material gas containing N_2 and H_2 is subjected to ammonia synthesis conditions to form ammonia.

27,378

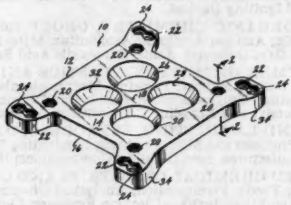
UNIVERSAL CARBURETOR-MANIFOLD ADAPTOR

Edwin E. Lohn, 231 S. Peck Drive, Los Angeles County, Calif. 90212

Original No. 3,366,145, dated Jan. 30, 1968, Ser. No. 465,442, June 21, 1965. Application for reissue June 24, 1970, Ser. No. 49,585

Int. Cl. F15d *1/04*

U.S. Cl. 138—39 6 Claims



[A thick substantially flat plate comprising an adapter body for interconnecting any of a variety of carburetor sizes to any of a variety of engine intake manifold sizes is disclosed. The plate or body defines a plurality of flow ports extending therethrough, which have a conical surface truncated at the flat surfaces of the plate, the conical axes of which converge centrally to intersect at a point removed from said body. Furthermore, the body defines a plurality of sets of quadrature spaces apertures, counter formed to define locking spaces on each side of the body.]

A plate comprising an adapter body for interconnecting any of a variety of carburetor sizes to any of a variety of engine intake manifold sizes is disclosed. The plate or body defines a plurality of flow parts extending therethrough which have a conical surface truncated at the flat surfaces of the plate. Furthermore, the body defines a plurality of sets of spaced apertures, counterformed to define locking spaces on each side of the body.

27,379

CONSUMABLE ELECTRODE FURNACE FOR ELECTROSLAG REFINING

Raymond John Roberts, Willingboro, N.J., and Geoffrey Hoyle, Sheffield, England, assignors to Consarc Corporation, Rancocas, N.J., and British Iron and Steel Research Association, London, England

Original No. 3,389,208, dated June 18, 1968, Ser. No. 636,117, May 4, 1967. Application for reissue Sept. 21, 1970, Ser. No. 73,800

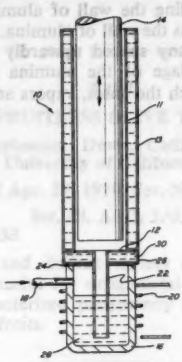
Claims priority, application Great Britain, Dec. 9, 1966, 55,369/66

Int. Cl. H05b *3/60*

U.S. Cl. 13—9 5 Claims

A consumable electrode furnace provided with a separate receptacle for molten slag and further provided with structure for introducing molten slag into the refining

zone of the furnace. Slag is forced into the refining zone by the application of gas pressure into a vessel provided



with a dip-tube communicating with the refining zone of the furnace.

27,380

FLOTATION MACHINE AND STATOR THEREFOR

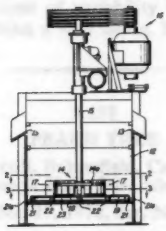
Charles M. Anderson, Salt Lake City, Utah, assignor to The Galigher Company, Salt Lake City, Utah

Original No. 3,327,851, dated June 27, 1967, Ser. No. 427,639, Jan. 25, 1965. Application for reissue June 12, 1969, Ser. No. 4,551

(Filed under Rule 47(b) and 35 U.S.C. 118)

Int. Cl. B03d *1/18*

U.S. Cl. 209—169 **9 Claims**



A flotation stator comprising a bubble peeler structure having a multiplicity of spaced stator blades radiating from and defining an impeller-receiving space and a bottom plate supportive of said blades with an opening below said impeller-receiving space configurated as the horizontal cross section of the interior of a flotation machine tank but somewhat smaller. The bubble peeler structure may have blades substantially uniform in length and relatively short compared to conventional bubble peeler blades.

27,381

PREPARATION OF IMITATION SOUR CREAM

Lawrence Lewis Little, Creve Coeur, Mo., assignor to The Battelle Development Corporation, Columbus, Ohio

No Drawing. Original No. 3,391,002, dated July 2, 1968, Ser. No. 425,961, Jan. 15, 1965. Application for reissue Jan. 13, 1970, Ser. No. 2,677

Int. Cl. A23c *9/10*

U.S. Cl. 99—54 **19 Claims**

Sour cream type products are prepared without butterfat or cultures by mixing an edible protein with an edible non-dairy lipoid, chemical emulsifiers, and whey separation inhibitors (gums), then pasteurizing and homogenizing, thereafter cooling and then adding an edible acid.

27,382

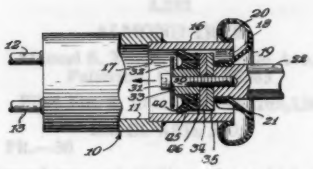
PISTON ASSEMBLY FOR PUMP

Paul W. Schlosser, 4452 N. Avers Ave., Chicago, Ill. 60625

Original No. 3,391,646, dated July 9, 1968, Ser. No. 671,368, Sept. 28, 1967, which is a continuation-in-part of Ser. No. 590,429, Oct. 28, 1966. Application for reissue Dec. 4, 1969, Ser. No. 881,962

Int. Cl. F04b *21/00, 39/00;* F16j *15/50;* F01b *31/00*

U.S. Cl. 417—439 **12 Claims**



A piston, reciprocating in the cylinder of a piston pump, has an annular seal around its periphery with a fluid venting passage communicating opposite sides of the seal to equalize pressure on opposite sides of the seal during a suction stroke of the piston. Disc-shaped sealing means are located behind the seal for closing the venting passage during the pressure stroke of the piston.

27,383

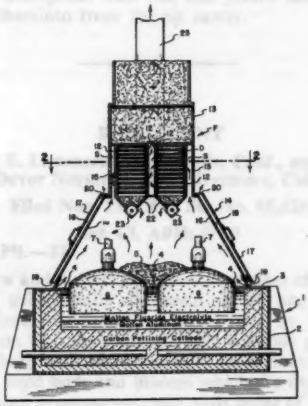
PROCESS AND APPARATUS FOR FILTERING EFFLUENT PRODUCED FROM ALUMINUM REDUCTION CELLS

Arthur F. Johnson, 203 Creole Lane, Franklin Lakes, N.J. 07417

Original No. 3,470,075, dated Sept. 30, 1969, Ser. No. 614,294, Feb. 6, 1967. Application for reissue Oct. 24, 1969, Ser. No. 882,760

Int. Cl. C22d *3/12;* C22b *21/00*

U.S. Cl. 204—67 **20 Claims**



This invention comprises an apparatus associated with [an] *a metallurgical furnace such as a* aluminum reduc-

tion cell and a process for directing the hot gases, vapors and dust issuing from the [cell] *furnace* and passing them through a wall of pulverulent [alumina] *absorbent* supported between upright metal walls having a multiplicity of openings. [The] *In an aluminum reduction cell, the* wall of alumina which may contain some admixed activated alumina, provides a physicophysical fixture which entrains the dust, absorbs the fluoride vapors and gaseous compounds, absorbs the heat and returns the absorbed chemicals, dust and heat to the cell. The wall of alumina is preferably supplied from an upper feed hopper and as the wall of alumina moves downwardly it engages means which controls feeding the wall of alumina into the cell which also maintains the wall of alumina. The metal walls preferably have many spaced upwardly disposed baffles which prevent spillage of the alumina and intervening spaces through which the gases, vapors and dust pass into the alumina.

PLANT PATENTS

GRANTED MAY 30, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,197

FRUITLESS OLIVE TREE

Hudson T. Hartmann, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 27, 1970, Ser. No. 32,468

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—33 1 Claim

1. The new and distinct variety of olive tree (*Olea europaea L.*), useful for ornamental purposes, as herein described, characterized particularly as to novelty by its failure to bear fruits.

3,198

DISTINCT VARIETY OF APPLE TREE NAMED SPUREEROME

Henry W. Miller, Jr., Paw Paw, W. Va., assignor to Hill Top Orchards & Nurseries, Inc.

Filed Dec. 2, 1970, Ser. No. 94,635

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree substantially as herein shown and described, characterized by: a compact spur type vegetable growth habit which promotes fruiting throughout the entire tree; fruit that is highly colored, the core of which is small with alternate bundles close to the core; buds in the leaf petiole axis which are large; a high percent of variability of said buds in the second year, forming a very dense, heavily spurred tree.

3,199

PEACH TREE

Lewis B. Sherrill, Bakersfield, Calif., assignor to Patterson & Hale, Bakersfield, Calif.

Filed Dec. 17, 1970, Ser. No. 99,329

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—43 1 Claim

A peach tree of medium size, medium vigor, spreading growth, vase form, hardy for California peach-producing areas, and a regular and very productive bearer of early ripening, large, uniform, globose, semi-clingstone fruit having firm yellow flesh and yellow skin overspread to a substantial extent with red.

3,200

WALNUT TREE

William Thornton Honeycutt, 2918 Baker Road, Modesto, Calif. 95351

Filed Dec. 24, 1970, Ser. No. 101,446

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—32 1 Claim

A large, vigorous, medium dense, English walnut tree having abundant foliage, large compound leaves with long petioles, and early leafing and flowering; the tree being a regular and heavy producer of large, light color, well distributed nuts in harvest approximately with the payne (unpatented), and the nuts—averaging better than two in the clusters—having unusually long stems, hulls which open freely and widely, and kernels which exceed fifty percent of the whole nut weight.

3,201

ALMOND TREE

Manuel S. Trinta, 706 Pomelo Ave., Patterson, Calif. 95363

Filed Jan. 8, 1971, Ser. No. 105,136

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—30 1 Claim

An almond tree, of medium size, which is vigorous, dense when young but more open when mature, upright to spreading, abundant of foliage with medium size leaves, and a regular and heavy producer of nuts well distributed on the tree; the nuts, which harvest easily and relatively early, being small, of very good quality, and averaging, by weight, forty-five to fifty percent kernel to nut, and with about forty kernels per ounce.

3,202

NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Jan. 28, 1971, Ser. No. 110,674

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—41 1 Claim

A nectarine tree of medium size, medium vigor, spreading, and a very productive bearer of uniform, freestone fruit of medium size and symmetrical globose form; the fruit, which is late in harvest, having yellow skin substantially overspread with red, and yellow flesh with red streaked thereinto from the pit cavity.

3,203

ROSE PLANT

Walter E. Lammerts, Watsonville, Calif., assignor to Devor Nurseries, Inc., Livermore, Calif.

Filed Nov. 10, 1970, Ser No. 88,526

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—21 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very upright and vigorous plant habit, large leathery and attractive dark green mature foliage, moderate sized buds and blooms which are usually borne in candelabra arrangement, said buds being of urn-shaped form and opening to high-centered blooms which show the stamens when the blooms reach a finishing wide-open stage, good flower petalage, with the petals having a heavy

substance, and a distinctive and attractive dark red flower color which is often striated with lighter and darker shades of red color.

3,204

KALANCHOE PLANT

James T. Irwin, Canyon, Tex., assignor to Irwin Greenhouses, Inc., Canyon, Tex.

Filed Nov. 27, 1970, Ser. No. 93,515

Int. Cl. A01h 5/00

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of kalanchoe plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a uniformly dwarf, spreading habit of growth, topped with numerous short-stemmed clusters of flowers, a highly self-branching and sturdy growing habit, a uniform blooming habit throughout the year, a distinctive and attractive rose pin flower color which blends well with the fern green foliage which has a wine colored etching on the reverse surface of the foliage and which is intensified under high light and cool weather conditions, long lasting qualities as a potted plant, an ability to initiate and develop flower buds during high night-time temperatures of summer when other varieties stall, and an ability to respond to photoperiod changes, with consequent suitability for year around flowering.

PATENTS

GRANTED MAY 30, 1972

GENERAL AND MECHANICAL

3,665,514

LOW PROFILE SIZE ADJUSTABLE PROTECTIVE HELMET

Philip E. Durand, Hudson, Mass., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 22, 1970, Ser. No. 74,348
Int. Cl. A42b *1/08*

U.S. Cl. 2—3 R **9 Claims**

A low profile protective helmet comprising a rigid shell lined with shock absorbing material, the shell being made up of separate front, center, and rear portions with the sides of the front and rear portions adjustably mounted in cantilever fashion on the sides of the center portion. The center portion is provided with a channel in its outer surface to receive the headband of a communications headset. The adjustable mounting enables the front and rear portions to be selectively mounted to provide a good fit over a range of head sizes and shapes. The front and rear edges of the center portion are provided with integral extensions which telescope with the adjacent edges of the front and rear portions to close the opening between the center portion and the front and rear portions throughout the range of adjustment. The shell may be formed of ballistic material or an outer shell of ballistic material may be worn over the helmet.

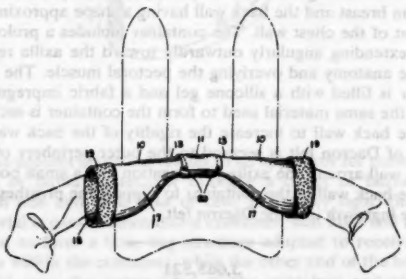
3,665,515

HANDLEBAR HAND PROTECTOR

John P. Sjostrom, Sr., Fox Lake, Ill., assignor to Cass Industries, Ltd., McHenry, Ill.

Filed Nov. 24, 1969, Ser. No. 879,323
Int. Cl. A41d *13/08*

U.S. Cl. 2—17 **10 Claims**



A handlebar hand protector for use on snowmobiles, bicycles, motorcycles and other devices having similar handlebars, comprising two flexible sleeves each having a narrow end and a wide end, the narrow end having means for attachment to a handlebar running through an opening defined by the narrow end, and the wide end defining an opening allowing entry of a hand to grasp the handlebar within the sleeve.

3,665,516

ADJUSTABLE LENGTH GARMENT

Alice Orovan, Olcott Hotel, 27 West 72nd Street, New York, N.Y.

Filed July 30, 1970, Ser. No. 59,628
Int. Cl. A41d *1/14*

U.S. Cl. 2—74 **9 Claims**

This garment construction, intended primarily for skirts, provides adjustment of the length of the garment. An outer portion of the skirt folds upward at its bottom edge and connects with lining material above it to form an inner portion of the skirt. The lower region of the lining can be lifted and attached, by detachable fastening means, to an upper region of the lining, and this rolls part of the outer portion around the lower edge so that the skirt becomes shorter. When the detachable fastening means are released, the parts fall back to their original positions with the fold or "hem" at a lower level.

3,665,517

ONE-PIECE OUTERWEAR WITH CUSHION

Sam M. Hyman, Manitowoc, Wis., assignor to S. M. Hyman Ltd., Manitowoc, Wis.

Filed June 10, 1970, Ser. No. 45,132
Int. Cl. A41d *3/00*

U.S. Cl. 2—84 **11 Claims**

A cold weather garment constructed of an impervious outer shell which is attached to an inner layer of porous pile fabric, leaving air spaces for air flow between the layers. The garment is particularly adapted for winter sports which require the wearer to be seated and has, therefore, an air cushion fixed between the garment layers from the small of the back to mid-thigh. The cushion has air tubes and pockets in a pattern contoured to fit the form of the legs and seat of the wearer. The cushion is inflated through an extendable tube connecting to the cushion and stored in a side pocket of

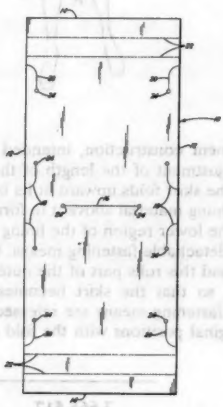
the suit. A full length zipper extending from the neck down the front and along the inside of one leg, and a second zipper on the other leg facilitate removal of the garment. Also included is a hood with a knit face mask that can be retracted and stored within the hood when not desired to be positioned over the face.

3,665,518

DISPOSABLE RAIN PONCHO

John L. Leadford, Pittsburgh, Pa., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1970, Ser. No. 65,493
Int. Cl. A41d *3/08*, *3/04*
U.S. Cl. 2—88 **8 Claims**



A disposable rain poncho formed of thin plastic. The poncho consists of a large rectangle of the sheet material formed with various perforations to define a center slit for the user's head, ties along the sides, and two optional features of tear-offs at the ends to adjust length and holes at the ends of the various perforations to disperse stress.

3,665,519

SIMULATED NECKTIE KNOT

Jerry J. Calhoun, Sr., 393 Lewis Blvd., S.E., St. Petersburg, Fla.

Filed Nov. 17, 1969, Ser. No. 877,143
Int. Cl. A41d *25/02*
U.S. Cl. 2—150 **1 Claim**

A simulated knot formed of sheet material or of plastic formed in an injection molding machine, preferably covered and padded, is bent around to form a front portion visible as a simulated knot and rear portions, the edges of which terminate in spaced relation to provide a slot for the easy insertion of the ends of the necktie, the device being provided with means therein for gripping the tie to prevent the device from slipping downwardly along the ends of the tie.

3,665,520

SURGICALLY IMPLANTABLE BREAST PROSTHESIS

Colette Perras, Lacombe, Montreal, and Jacques Papillon, St. Lambert, Montreal, both of Canada, assignors to Medical Engineering Corporation, Racine, Wis.

Filed Oct. 7, 1970, Ser. No. 78,863
Int. Cl. A61f *1/24*; A41c *3/10*
U.S. Cl. 3—36 **12 Claims**

A surgically implantable breast prosthesis formed from a flexible container having a front wall and a back wall; the front wall having an outer shape approximately that of the human breast and the back wall having a shape approximately that of the chest wall. The container includes a prolongation extending angularly outwardly toward the axilla region of the anatomy and overlying the pectoral muscle. The container is filled with a silicone gel and a fabric impregnated with the same material used to form the container is secured to the back wall to increase the rigidity of the back wall. A strip of Dacron felt is secured to the outer periphery of the back wall around the axilla prolongation and a small portion of the back wall of the container to support the prosthesis by tissue ingrowth into the Dacron felt.

3,665,521

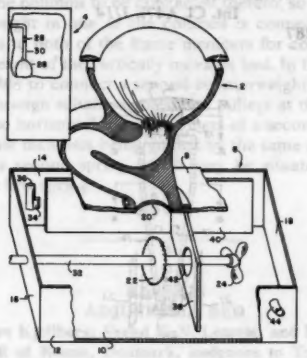
MARINE TOILET

George H. Cooke, P.O. Box 4552, Fort Lauderdale, Fla.

Filed Aug. 15, 1969, Ser. No. 850,520
Int. Cl. B02c *18/40*, *18/14*
U.S. Cl. 4—10 **4 Claims**

A processing tank for a mobile water closet having a blade for masticating and grinding waste material, a propellor for

generating a flow within the tank, and a plurality of partitions for creating a circulatory flow pattern to insure complete processing of the waste material by preventing accumulation



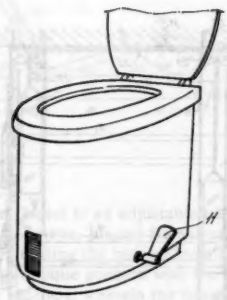
of large solids within the tank. A chlorinating device is inserted in the flow pattern for proper chlorination of all waste material.

3,665,522

APPARATUS FOR COLLECTING SOLID OR LIQUID WASTES

Bernt S. Backlund, Orebro; Goran P. A. Forslund, Nora Stad, and Eleon G. Eriksson, Nykoping, all of Sweden, assignors to Pactosan AB, Nora Stad, Sweden

Filed Nov. 17, 1969, Ser. No. 877,170
Int. Cl. A47k *11/02*
U.S. Cl. 4—142 **3 Claims**



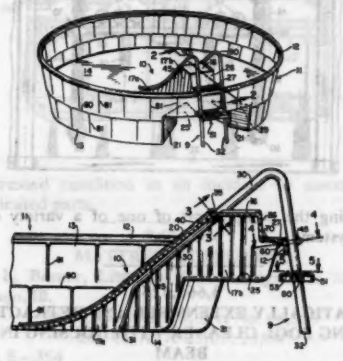
The present invention relates to an apparatus for collecting solid or liquid wastes, for example a closet or latrine, in which one end of a hose of thin, preferably tight, flexible material is passed down into a container, said hose end being sealed to form a hose bag structure adapted to receive the waste within the container, while the other end of the hose is passed over the upper edge of the container and stowed together with a considerable length of said hose in a storage space outside the container, to form a supply source from which the hose is fed successively into the container as the apparatus is used, and in which apparatus the container rests on a tubular support structure through which the hose is passed to a collecting vessel.

3,665,523

POOL STRUCTURE WITH BUILT-IN, EXTERNALLY SUPPORTED SLIDE

Ascher Chase, Norfolk, Va., assignor to General Foam Plastics Corp., Norfolk, Va.

Filed Oct. 20, 1970, Ser. No. 82,474
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172 **12 Claims**



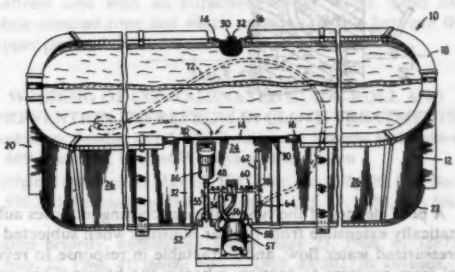
A molded tub-like structure, with a peripheral flange, having an integrally molded, but externally rail supported, sliding surface projecting well above the peripheral flange thereof is disclosed herein. The tub and sliding surface are unitarily formed of comparatively light-weight thermoplastic sheet material. The slide portion is reinforced and structurally supported by a truss including a pair of tubular parallel support members or rails, upon which inverted channel-like side edges of the sliding surface rest. The rails extend from beneath the sliding surface upwardly through openings formed in elevated portions thereof, and they then extend downwardly and outwardly of the structure forming hand rails for a step ladder leading up to the top of the elevated sliding surface. The truss includes a plurality of transverse cross bars, at least one of which advantageously may form a step or step support, providing additional support for the sliding surface.

3,665,524

ABOVE-THE-GROUND SWIMMING POOL

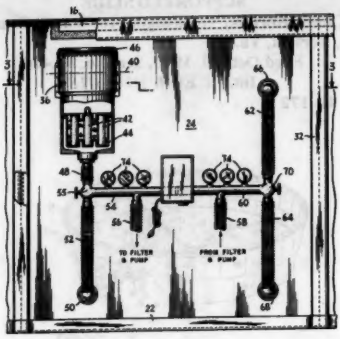
Frank Jannuzzi, Sr., 239 Maple Ave., North Plainfield, N.J.

Filed Mar. 3, 1971, Ser. No. 120,561
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.19 **6 Claims**



The wall of an above-the-ground swimming pool is constructed with a panel element that is interchangeable with

other panel elements, each of which has pre-formed openings



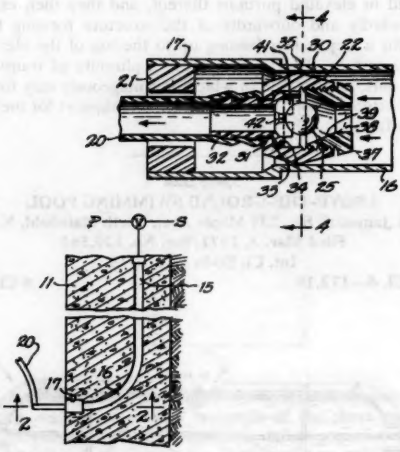
for receiving the components of one of a variety of pool cleaning systems.

3,665,525

AUTOMATICALLY EXTENSIBLE AND RETRACTABLE SWIMMING POOL CLEANER WITH HOUSING IN BOND BEAM

Herbert H. Howard, Woodland Hills, Calif., assignor to Marine Swimming Pool Equipment Co., North Hollywood, Calif.

Filed Jan. 11, 1971, Ser. No. 105,337
Int. Cl. E04h 3/20
U.S. Cl. 4—172.15 **9 Claims**



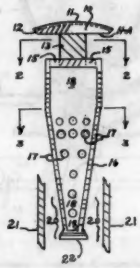
A pool cleaner of the type utilizing scouring jet hoses automatically extensible from tubular housings when subjected to pressurized water flow, and retractable in response to reversal from pressure to suction, wherein the housings are contained in the bond beam of the pool and connected to the pool by short radius bends, the rear ends of the hoses being pistons which are pivotally attached thereto so as to traverse said bends without binding therein.

3,665,526

COMBINED DRAINAGE STOP-VALVE CONICAL STRAINER DEVICE

Frank P. Hoffman, 1270 East 19th St., Brooklyn, N.Y.

Filed June 3, 1970, Ser. No. 43,097
Int. Cl. A47k 1/14
U.S. Cl. 4—287 **1 Claim**



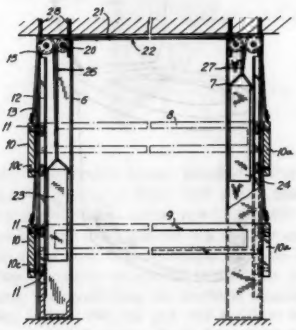
This invention relates to improvements in the art of conventional lavatory pop-up plumbing drain valves and comprises a removably disposed combined drainage stop-valve conical strainer configuration for drainage and seating, having baffle apertures in it's inclined wall permitting liquid waste water to pass, but preventing elongated solid waste objects from passing into the drainage system that could cause stoppage.

3,665,527

CONCEALABLE BEDS

Vincente Emo Gonzalez, Calle Balmes 351, Barcelona, Spain

Filed Sept. 29, 1969, Ser. No. 870,324
Claims priority, application Spain, Oct. 2, 1968, 358,735
Int. Cl. A47c 19/06
U.S. Cl. 5—10 B **5 Claims**



Structure for supporting a bed for movement between a position of non-use adjacent a ceiling of a room and a position of use adjacent a floor of a room. The structure includes hollow vertical columns extending between and fixed to the floor and ceiling of the room with the columns having outer walls directed away from each other and formed with elongated slots. Within the columns adjacent the slots are guides which communicate with the slots, and a pair of horizontal frame members which are adapted to carry a spring extend horizontally across the outer walls of the columns and carry guide members which extend through the slots into the guides within the columns to be guided thereby for vertical movement. A counterweight is freely movable vertically in

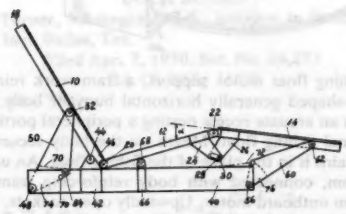
one of the columns in the space therein which is not occupied by the guide, and a pair of cables extend from the counterweight upwardly around pulleys at the top of the columns to the opposed frame members which extend across the outer walls of the columns to be connected thereto, so that this one counterweight in one of the columns is connected through the cables to both of the frame members for counterbalancing the weight of the vertically movable bed. In the same way it is possible to connect a second counterweight in the other column through suitable cables over pulleys at the top of the columns to horizontal frame members of a second bed, these latter frame members being guided by the same columns and carrying a second spring which may be situated above or below the first spring.

3,665,528

ADJUSTABLE BED

Finn Andre Kjellberg; Svend E. N. Lemvig, and Bent I. Kjellberg, all of Ronne, Denmark, assignors to Trioteam A/S, Ronne, Denmark

Filed July 28, 1970, Ser. No. 58,770
Claims priority, application Denmark, Aug. 1, 1969, 4148
Int. Cl. A47c *3/32*; A61g *7/10*
U.S. Cl. 5—67 **6 Claims**



The invention relates to an adjustable bed having a bottom resting upon a tripartite, hinged frame, and being provided with means for adjusting the bottom from a neutral, horizontal position to an oblique position with the foot end elevated, and to a folded position, wherein the back-supporting part is oblique or vertical, the two other parts forming a reversed V, the adjustment means being designed so as to be operated by a single mechanism maneuvered by the person occupying the bed.

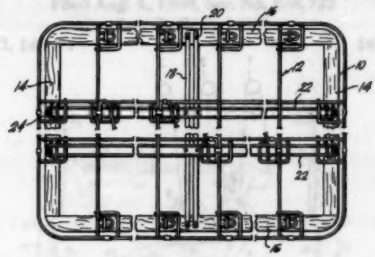
3,665,529

FRAME FOR BOX SPRING ASSEMBLY

Walter V. Slominski, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed July 21, 1970, Ser. No. 56,933
Int. Cl. A47c *23/02*
U.S. Cl. 5—264 **7 Claims**

A box spring frame having side and end rails made of wood and cross rails and a support bar made of sheet metal. The cross rails and the support bar have interlocking means formed out of the sheet metal which can be interconnected



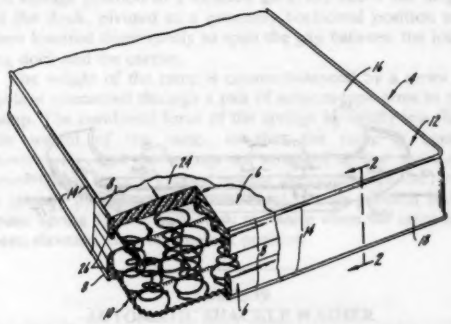
in a stressed condition as an incident to assembling the prefabricated parts.

3,665,530

MATTRESS TOPPER PAD

Ernest L. Basner, Littleton, Colo., assignor to Sealy, Inc., Chicago, Ill.

Filed June 8, 1970, Ser. No. 44,369
Int. Cl. A47c *25/00*, *23/04*
U.S. Cl. 5—354 **22 Claims**



An improved topper pad for a mattress unit wherein the topper pad is positioned on an inner spring unit and has extending outwardly from its peripherial edge a preformed lip or welting encompassing the top portion of the topper pad. The inner spring unit is covered with ticking positioned on the topper pad so its edges abut the welting. A strip of trimming fabric covers the welting and overlaps the edges of the ticking panels, the trimming fabric and the ticking panels being sewn to the welting at its base, thus, constructing a mattress unit with an attractive border which looks like fabric-covered rope and which prevents shifting between the topper pad and the ticking panels.

3,665,531

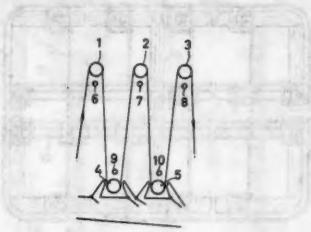
WASHING OF CONTAMINATED GUIDE-ROLL AND PREVENTION THEREFROM IN CLOTH TREATMENTS

Yoshikazu Sando, 122-6 Nishihoma, and Hiroshi Ishidoshiro, 469 Wakayro, both of Wakayama-ken, Japan

Original application May 16, 1967, Ser. No. 638,795, Pat. No. 3,593,353. Divided and this application Oct. 13, 1970, Ser. No. 80,404
Claims priority, application Japan, May 23, 1966, 41/32873; Nov. 22, 1966, 41/76606; Nov. 7, 1969, 44/102720. Divided
Int. Cl. B05c *11/00*
U.S. Cl. 8—151 **4 Claims**

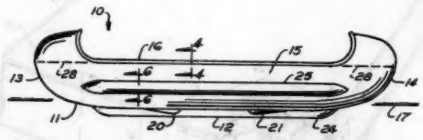
A method of cleaning the surfaces of guiderolls used in treating and processing cloth is comprised of the steps of attaching lengths of guide cloths, which are provided with wip-

ing surfaces on both sides, to lengths of the cloth being processed so that the guide cloth and the cloth being processed are continuously passed over the guiderolls. Dampening at least one or both of the guide cloth and the



guiderolls so that the guiderolls are wiped clean as the guide cloths pass over them. Preferably, the guiderolls are reversed from the normal direction of rotation to assist in the cleaning operation.

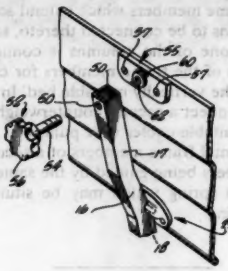
3,665,532
WATERCRAFT
Lawrence V. Simpson, 4110 Estateway Rd., Toledo, Ohio
Filed Mar. 27, 1970, Ser. No. 23,180
Int. Cl. B63b *35/00*
U.S. Cl. 9—1 R **9 Claims**



A watercraft for use in a water sport in which the craft is propelled by a passenger paddling with his hands. The watercraft has a generally flat bottom and is symmetrical, such that the passenger may face either end of the watercraft while paddling. Two pairs of stabilizing indentations are formed in the flat bottom, one pair for receiving the passenger's knees while kneeling and facing one end and the other pair for receiving the passenger's knees while kneeling and facing the other end. When the watercraft is canoe shaped and has upturned ends, it may be equipped with floatation such that it is difficult to swamp and is self-uprighting when swamped. The floatation includes a pair of elongated floats projecting from and extending along the sides of the canoe above the normal waterline and float means positioned in the upturned ends of the canoe and vertically spaced above the bottom of the canoe.

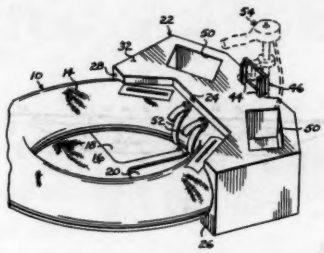
3,665,533
WATER CRAFT LAUNCHING AND REMOVAL MEANS
William W. Kleinau, 5100 Borland Rd., Los Angeles, Calif.
Filed Aug. 5, 1970, Ser. No. 61,343
Int. Cl. B63c *13/00*
U.S. Cl. 9—1 T **4 Claims**

Broadly, the invention is directed to an easily fabricated, easily usable assemblage for the launching and removal of water craft. The major components of the apparatus comprise load bearing wheeled strut assemblies cooperable with coupling members disposed on the water craft, which strut members are easily detachable, and stored when not in use. In another embodiment of the invention, a kit assemblage is



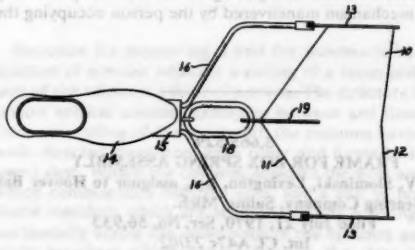
disclosed by which existing water craft may be modified in accordance with the practice of the invention.

3,665,534
FISHING FLOAT MOTOR SUPPORT
Hubert L. McIntyre, 1406 E. Tonkawa, Tonkawa, Okla.
Filed June 11, 1970, Ser. No. 45,452
Int. Cl. B63h *7/08*
U.S. Cl. 9—2 A **2 Claims**



In a fishing float motor support, a framework reinforced polygonal-shaped generally horizontal buoyant body is provided with an arcuate recess nesting a peripheral portion of a conventional fishing float. Means on the body secures it to and maintains it in the plane of the fishing float. An upstanding transom, connected with body reinforcing framework, supports an outboard motor. Upwardly open sockets, formed in the body, support fishing equipment and a battery to provide electrical energy for the motor.

3,665,535
SWIM FIN
James B. Picken, 13103 E. 13th Place, Spokane, Wash.
Filed Aug. 13, 1970, Ser. No. 63,541
Int. Cl. A63c *31/10*
U.S. Cl. 9—304 **13 Claims**



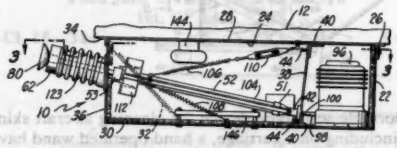
A swim fin having a rigid or flexible web pivotally mounted on a rigid frame extended forwardly from the toe of the user.

The rigid web is pivoted intermediate its longitudinal ends. A flexible web is controlled with respect to longitudinal curvature. Both forms are limited in the extent of angular movement available.

3,665,536
LEVELING DEVICE

Harold G. Jackson, 3747 Fanwood Ave., Long Beach, Calif.

Filed May 11, 1970, Ser. No. 35,987
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **6 Claims**

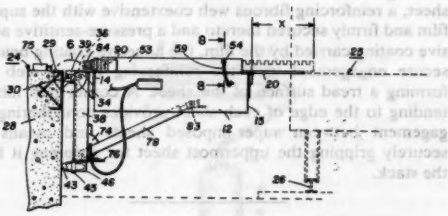


A leveling device for use in maintaining a relative position between two structures, one of which can be moved if the other is moved so as to maintain the same relative position between the two structures can be constructed so as to utilize a suction cup carried on the structure which can be moved in response to movement of the other structure. In such a device the suction cup is carried upon a movably mounted member so that when motion is transmitted to the member through the suction cup the member causes actuation of motion detection means. Such means are connected to the structure which can be moved so as to cause movement of this structure in response to movement of the other structure.

3,665,537
DOCK BOARD

Ernest Turner, Muskegon, Mich., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 7, 1970, Ser. No. 26,271
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **10 Claims**

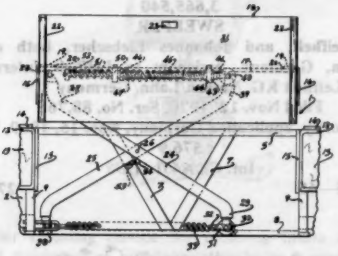


A positionable dock board or gangway for service bridging the space separation between railway box-cars and a cargo shipping and/or receiving dock situated adjacent the railway track. The dock board unit hereof includes a platform securable to the dock facing with which it is to be used in a manner providing for pivotal platform movement between a horizontal service position and a vertical storage position. When in the vertical relation, the unit affords increased ease of longitudinal positioning for traversing between cars and precise locating at a car door. Transversely extending adjustable support arms enable accommodating variable spacing between dock and car while turnover plates at the free end have an adjustable pivot axis permitting greater angular offset and consequent ease of cargo handling in immediately adjacent car areas.

3,665,538
DOCKBOARD

Matthew Smith, West Allis, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Aug. 1, 1969, Ser. No. 846,722
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **16 Claims**



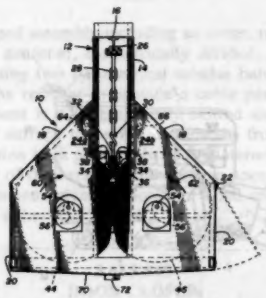
A dockboard to span the gap between a loading dock and the bed of a carrier. The ramp of the dockboard is stored vertically along the front wall of the dock and the side edges of the ramp are pivotally connected to guide members which are movable in vertical guideways mounted on the front surface of the dock. The ramp is raised upwardly from its vertical storage position to a location generally above the height of the dock, pivoted to a generally horizontal position and then lowered downwardly to span the gap between the loading dock and the carrier.

The weight of the ramp is counterbalanced by a series of springs connected through a pair of scissors-type arms to the ramp. The combined force of the springs is slightly less than the weight of the ramp, so that the ramp is biased downwardly, and the springs are arranged so that the maximum spring force is exerted against the ramp when the ramp is initially moved up from its vertical storage position and a lesser spring force is applied to the ramp when the ramp has been elevated to an above dock position.

3,665,539
AUTOMATIC SHACKLE WASHER

Janus J. Dillon, Irving, Tex., assignor to Food Equipment, Inc., Dallas, Tex.

Filed Apr. 9, 1970, Ser. No. 26,892
Int. Cl. A46b *13/02*
U.S. Cl. 15—21 D **6 Claims**



Shackles are transported by an overhead conveyor through a housing. A pair of motor rotated brushes are mounted on opposite sides of the housing along the path of travel of the shackles. The brushes comprise a plurality of flexible fibers extending from a center axis. When at rest, the flexible fibers

of the brushes tend to droop downwardly to form a clearance between the brushes so that the shackles may travel unimpeded between the brushes. When the brushes are rotated, the flexible fibers extend outwardly into contact with the shackles for cleaning thereof. Structure is provided to direct fluid upon the brushes and the shackles during operation of the system.

3,665,540

SWEEPER

Gunter Leifheit, and Johannes Liebscher, both of Nassau/Lahn, Germany, assignors to Leifheit International Gunter Leifheit KG, Nassau/Lahn, Germany

Filed Nov. 12, 1970, Ser. No. 88,765
Claims priority, application Germany, Nov. 15, 1969, P 19 57 576.9
Int. Cl. A47l *11/08*
U.S. Cl. 15—45 **27 Claims**

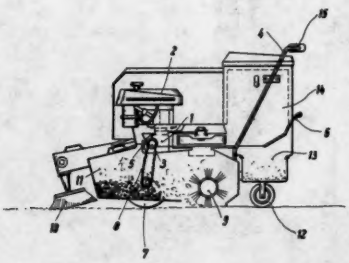
A carpet sweeper has a housing which includes a frame-shaped lower portion of readily formable and deformable material and having an upper and a lower open side. An upper cover portion of less readily deformable shape-retaining material overlies the upper open side and is connected with the lower portion in shape-retaining relationship. Wheels are provided in the lower portion and project partly through the lower open side to support the sweeper for movement on the surface and one or more brush holders are similarly mounted. Journal means is carried by the lower portion for rotatably journalling the wheels and the brush holder or rollers.

3,665,541

MOTOR-DRIVEN SWEEPING MACHINE

Dieter Frehe, Macon, France, assignor to Walter Gutbrod and Wolfgang Gutbrod, Bubingerhof, Bubingen, Saar, Germany

Filed June 12, 1970, Ser. No. 45,707
Claims priority, application Germany, Jan. 12, 1970, P 20 01 046.2
Int. Cl. E10h *1/02*; F16h *37/08*
U.S. Cl. 15—83 **4 Claims**



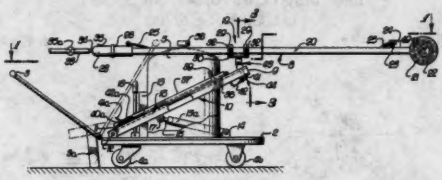
A motor-driven floor sweeping machine which has a sweeping mechanism having a shaft driving a change-speed gearing for a travel mechanism, the shaft extending axially relative to drive wheels and carrying a multiple-disc clutch.

3,665,542

PORTABLE POWER SCRUBBER WITH LEVERAGED PRESSURE FEATURE

Thomas G. Franzreb, Rolling Hills, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.

Filed Dec. 3, 1970, Ser. No. 94,762
Int. Cl. B64f *5/00*
U.S. Cl. 15—98 **6 Claims**



A portable scrubbing device for cleaning aircraft skin surfaces including on a carriage, a hand operated wand having a cleaning head and a handle at opposite ends, power driven brush means at the cleaning head, and means supporting the wand slidably intermediate its ends including structure mounting the wand for pivoted movement by an operator grasping the handle to variously apply the cleaning head to the surfaces to be cleaned.

3,665,543

TACKY MAT STACK

John J. Nappi, 80 Berkley Rd., Berlin, Conn.

Filed Nov. 19, 1970, Ser. No. 91,095
Int. Cl. A47l *23/22*
U.S. Cl. 15—215 **12 Claims**

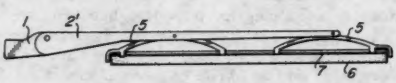
An improved tacky mat stack is comprised of a plurality of superimposed tacky mat sheets each having a composite laminar construction consisting of a thin flexible support film forming an adhesive barrier surface on the bottom of the sheet, a reinforcing fibrous web coextensive with the support film and firmly secured thereto and a pressure-sensitive adhesive coating carried by the film, the adhesive coating being in secure engagement with the reinforcing fibrous web and forming a tread surface of the sheet. A corner pull tab extending to the edge of each sheet provides nonadhering engagement between super-imposed sheets and means for securely gripping the uppermost sheet for stripping it from the stack.

3,665,544

WINDSHIELD WIPER FOR VEHICLES

Kashira Sakamoto, 12, Tennocho-7-chome, Kariya, Japan

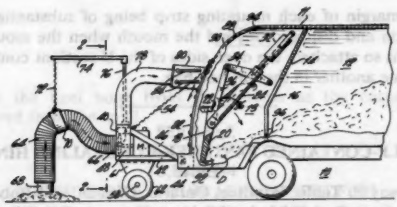
Filed Aug. 24, 1970, Ser. No. 66,294
Claims priority, application Japan, Dec. 27, 1970, 45/1167; 45/1168; Mar. 20, 1970, 45/23976; Mar. 23, 1970, 45/24292
Int. Cl. B60s *1/32*
U.S. Cl. 15—250.42 **6 Claims**



In a windshield wiper for vehicles, yoke members are directly fixed to an arm. At least one of the yoke members

comprises two sections between which is loaded a spring so as to normally bias the two sections and therefore a blade toward the windshield. Alternatively, a spring may be loaded between the arm head and arm piece which may comprise two bar-shaped members. Even when the windshield is curved, the blade may be uniformly pressed against it. A number of pivotal connection members is reduced so that less noise is produced. Since a number of components is reduced, the assembly is much facilitated at less cost.

3,665,545
APPARATUS FOR COLLECTING DEBRIS
William Beekman, 66 Park View Rd., Elmsford, N.Y.
Filed June 4, 1970, Ser. No. 43,510
Int. Cl. A47l *5/36*
U.S. Cl. 15—314 **5 Claims**

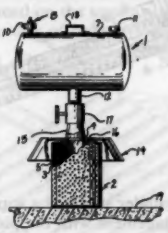


A truck, including a storage compartment and a hopper to the rear of the storage compartment, has a blower connected to the rear end of said truck for picking up debris and directing same into the storage compartment of said truck. A compacting mechanism is positioned in the hopper of said truck for transporting the debris from the hopper into the storage compartment and thereby compacting the debris in the storage compartment. A vent is provided at the top of the hopper for air pressure relief.

3,665,546
ELECTRICAL POLISHING APPARATUS
Edward R. Horeni, 2433 S. Pulaski Rd., Chicago, Ill.
Filed June 4, 1970, Ser. No. 43,520
Int. Cl. B60s *3/06;* **A47l** *5/26*
U.S. Cl. 15—383 **3 Claims**

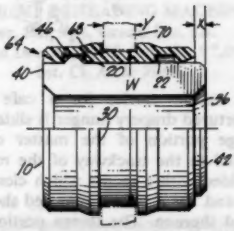
A hand-held polishing device of the type that can be used for polishing automobiles, in which the polishing member is generally cylindrical in shape with the cylindrical axis being the axis of rotation. A handle encloses an electric motor the rotational axis of which is substantially perpendicular to the rotational axis of the polishing member, and a flexible shaft couples the polishing member to the shaft of the electric motor.

3,665,547
FILTER CLEANING DEVICE
John F. Boylan, Route 1 Box 81, Ulysses, Kans.
Filed Aug. 27, 1970, Ser. No. 67,355
Int. Cl. B08b *5/02*
U.S. Cl. 15—406 **1 Claim**



A filter cleaning device for cleaning filters of porous material employed as air cleaners includes a pressure tank adapted to contain gaseous fluid under pressure and a flow conduit communicating with the tank and extending therefrom and having a baffle or shield mounted on the flow conduit and sized and shaped to engage the filter to be cleaned whereby the fluid under pressure is directed into an interior chamber of a filter upon actuating a control of the fluid thereby permitting flow of fluid under pressure from the tank into the filter to be cleaned and discharge of said fluid through the filter material in a direction opposite to the flow of air therethrough in normal operation of the filter.

3,665,548
CABLE FAIRLEAD ASSEMBLY
Kurt E. Mason, Fullerton, Calif., assignor to McDonnell Douglas Corporation
Filed Aug. 5, 1970, Ser. No. 61,053
Int. Cl. F16l *5/00*
U.S. Cl. 16—2 **8 Claims**

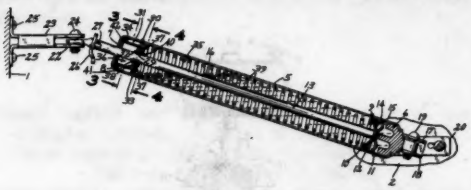


Cable fairlead assembly including an outer, retainer, sleeve element and an inner, diametrically divided, grommet element comprising two symmetrical tubular halves secured in position by the retainer to provide a cable passageway. The retainer element is a longitudinally slotted sleeve having a shaped outer surface to permit installation from either side of, and retention in, a panel hole of predetermined size. The inner surface of the retainer is shaped to accept and secure the two grommet halves in position when installed in the retainer from either end thereof.

3,665,549
DOOR CLOSER
Bert A. Quinn, 2419 North Pascal, St. Paul, Minn.
Filed Mar. 23, 1970, Ser. No. 21,578
Int. Cl. E05f *3/10*
U.S. Cl. 16—52 **5 Claims**

A hydraulic door closer cylinder having a closed end and an opposite open end, a piston slidably mounted in the

cylinder, a cooperating piston rod projecting axially outwardly through the open end, and mounting means for disposing the cylinder at an oblique angle to the horizontal and sloping upwardly from its closed end to its opposite end.



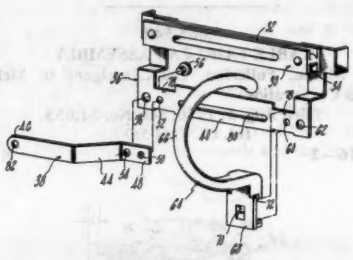
Structure in the cylinder supports a wiper element in encompassing sliding engagement with the piston rod, and disposable means engages the cylinder and piston to prevent leakage of liquid from the cylinder during shipment or storage.

3,665,550

MASTER CARRIER WITH AUTOMATICALLY ADJUSTABLE RING

Walter J. MacFarlane, Kensington, and Robert R. Russo, East Haven, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Oct. 30, 1970, Ser. No. 85,394
Int. Cl. A47h *15/00*
U.S. Cl. 16—93 **7 Claims**



A universal master carrier for a cafe transverse rod wherein an apertured drapery hanger is slidably mounted on a slotted flange portion of the master carrier disposed generally parallel to the trackway of the rod. The drapery hanger is provided with a recess which closely receives the flange portion and has a pair of opposed shoulders to maintain it mounted thereon. The flange portion has a necked down section for assembly of the drapery hanger and the drapery hook is inserted through the aperture of the drapery hanger and the slot of the flange portion to prevent the inadvertent disengagement of the drapery hanger from the master carrier. A reversible and removable overlap arm is also disclosed.

3,665,551

PAIR OF CARRYING HANDLES OF FLEXIBLE PLASTICS MATERIAL FOR CARRIER BAGS OF PLASTICS

Manfred Ender, St. Gallen, Switzerland, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Dec. 21, 1970, Ser. No. 99,827
Claims priority, application Germany, Dec. 22, 1969, P 19 64 300.6
Int. Cl. A47h *95/02*
U.S. Cl. 16—110 **7 Claims**

The invention relates to a pair of carrying handles of flexible plastics material, preferably polyethylene, for carrier bags of plastics, paper or The like, in which each handle comprises a hand grip portion and a mounting strip that can be attached to a respective wall of the bag along the bag mouth,

one margin of each mounting strip being of substantially U section and disposed beyond the mouth when the mounting strip is so attached, the open sides of the U sections confronting one another in the finished bag.

3,665,552

SELF-CONTAINED FASTENER-CONCEALING HINGE LEAF

Anthony P. Toldo, Windsor, Ontario, Canada, and Robert E. Watson, Orchard Lake, Mich., assignors to Swedish Crucible Steel Company, Detroit, Mich.

Filed Feb. 2, 1970, Ser. No. 7,757
Int. Cl. E05d *11/00*
U.S. Cl. 16—148 **1 Claim**

A hinge leaf of synthetic plastic material, such as polyethylene or polypropylene, is provided with fastener holes to secure the hinge leaf to the toilet seat or lid or other hinge member, and also has a recess adjacent these holes. Formed integral with the hinge leaf so that it cannot be lost or misplaced and is always at hand is a fastener hole cover which swings downward to conceal the fastener holes and has a tongue or lug which fits snugly into the recess as a detent to hold the cover in place.

3,665,553

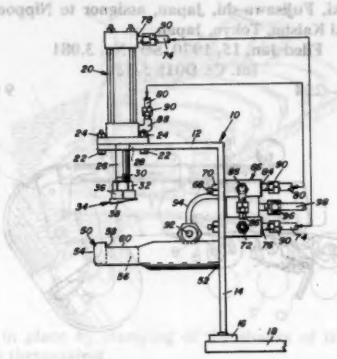
KEEL BONE EXTRACTOR FOR POULTRY PRODUCTS

George V. Colosky, Nampa, Idaho, assignor to Avi-Simplot, Inc., Nampa, Idaho

Filed Apr. 7, 1970, Ser. No. 26,378
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **1 Claim**

This disclosure relates to a method and apparatus for breaking and extracting the keel bone from various types of dressed poultry carcasses. The apparatus includes an air cylinder having a pressure foot attached to the end of the air cylinder piston rod, and an anvil for supporting a poultry carcass. The anvil has a slot which is to be positioned under the keel bone of the carcass being processed. The pressure foot is used to force the keel bone into the anvil slot and

cooperate with the side of the anvil to break the keel bone from the carcass. An extractor cup on the end of the anvil



severs the keel bone from the carcass as the carcass is removed from the anvil.

3,665,554

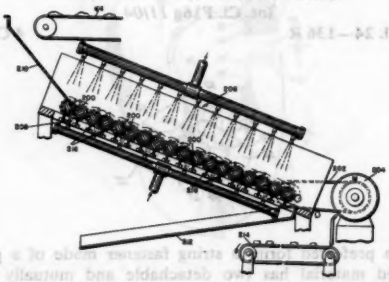
METHOD OF EVISCERATING SHELLFISH

Richard T. Wenstrom, Hampton, Va., and Thomas S. Gorton, Jr., Cambridge, Mass., assignors to Slade Gorton & Co., Inc., Boston, Mass.

Original application July 17, 1967, Ser. No. 659,274, now Patent No. 3,528,124. Divided and this application Sept. 10, 1970, Ser. No. 71,118

Int. Cl. A22c *29/00*

U.S. Cl. 17—45 **5 Claims**



A method and apparatus for shucking raw uncooked unfrozen shellfish of the bivalve type which includes the method of opening the shells by shocking the shellfish, cleaning the viscera from the edible muscle of the shellfish and the apparatus for opening and cleaning the same.

3,665,555

SCALLOP PROCESSING

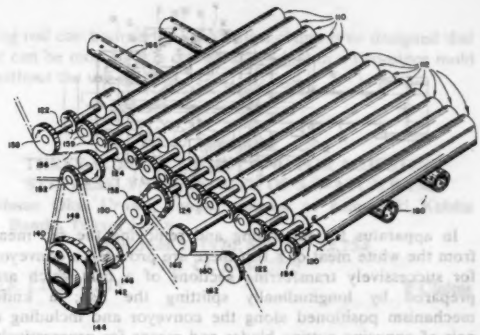
Elmer Dryden Willis, Williston, N.C., assignor to Willis Bros., Inc., Williston, N.C.

Original application May 27, 1968, Ser. No. 732,247, now Patent No. 3,562,855, dated Feb. 16, 1971. Divided and this application Mar. 11, 1970, Ser. No. 23,529

Int. Cl. A22c *29/00*

U.S. Cl. 17—53 **5 Claims**

A method and apparatus are provided for extracting the adductor muscle from scallops. Scallops are subjected to a heat shock and are then mechanically agitated to disengage the muscle and attached viscera from the shell. The muscle and viscera are removed from the shells and separated from unfragmented portions of the shells on a vibrating screen and are then contacted with water before being separated from small shell fragments by flotation in a brine solution. Viscera is removed from the muscles by pulling on the viscera while restraining movement of the muscles. The invention also includes a method and apparatus for removing viscera from the adductor muscle of shucked scallops. Scallop muscles and attached viscera are placed on the upper surface of an inclined path formed by a plurality of rollers. Viscera is pulled from



the scallop muscle and through the nip formed by adjacent rollers by rotating the upper portion of adjacent rollers towards each other. Detached viscera is cleaned from the rolls below the inclined path. Advance of scallop muscles down the path is controlled by intermittently rotating the upper portion of adjacent rollers away from each other to permit the lower of the adjacent rollers to advance the muscle down the path and by spraying a flow of fluid on at least some of the muscles on the path to affect their rate of movement down the path.

3,665,556

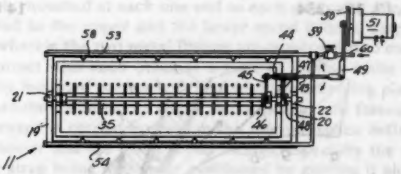
SHRIMP DEHEADING MACHINE

William J. Gruber, Box 904, Grand Isle, La.

Filed Dec. 11, 1970, Ser. No. 97,068

Int. Cl. A22c *29/00*

U.S. Cl. 17—71 **12 Claims**



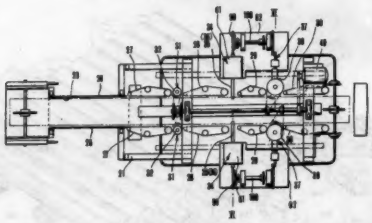
A shrimp deheading apparatus consisting of an arcuate rockable inclined trough having upstanding pins and a rocker bar carrying depending prongs which extend between the upstanding pins. The bar rocks coaxially with the trough and both are rocked simultaneously in opposite directions by a common motor. Water jets are applied to the interior of the trough. The spacing between the upstanding pins and the depending prongs is such that shrimp delivered into the trough are engaged simultaneously by the pins and prongs and are thereby bent in a manner to break the heads of the shrimp away from their edible body portions. The lower end of the trough is open to allow the deheaded shrimp to be washed into a receiving container.

3,665,557

APPARATUS FOR REMOVING RED MEAT FROM FISHES

Hideo Uekusa, Tokyo, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Apr. 21, 1970, Ser. No. 30,446
Claims priority, application Japan, Apr. 24, 1970, 45/31650; Apr. 7, 1970, 45/29583
Int. Cl. A22c *25/14*
U.S. Cl. 17—61 8 Claims



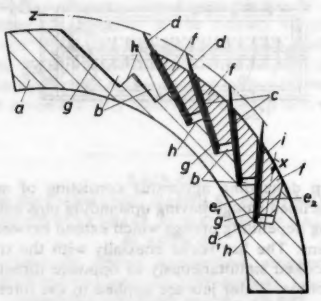
In apparatus for separating and removing the red meat from the white meat of a fish there are provided a conveyor for successively transferring sections of a fish which are prepared by longitudinally splitting the fish; a knife mechanism positioned along the conveyor and including a pair of opposing cutting blades and means for progressively varying the cutting angle and cutting depth of the cutting blades through the split sections in synchronism with the movement thereof so as to cause the cutting blades to cut through the interface between the red and white meat of the split sections throughout the length thereof; and a deep cutting mechanism positioned along the conveyor and including a pair of opposed rotary cutters perpendicular to the path of travel of the split sections and cam means for progressively varying the depth of cut of the rotary cutters through the split sections to position the outer ends of the rotary cutters at the deepest positions of the red meat throughout the length of the split sections.

3,665,558

MOUNTING ASSEMBLY FOR MOUNTING NEEDLE CARRIERS ON A COMB OF A COMBING MACHINE

Josef Egerer, Schwabach, Germany, assignor to Staedtler & Uhl, Schwabach (Bayern), Germany

Filed Feb. 5, 1970, Ser. No. 8,817
Claims priority, application Germany, Feb. 8, 1969, P 19 06 396.8
Int. Cl. D01g *19/10*
U.S. Cl. 19—234 14 Claims



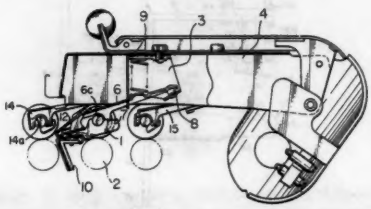
Needle carriers are mounted on a holder and particularly on a holder segment of a round comb of a combing machine by providing on the holder abutment surfaces, one for each carrier. Wedges or cleats clamp the bases of the carriers against these abutment surfaces so that the carriers are releasably locked in position on the holder.

3,665,559

MECHANISM FOR SUPPORTING AN APRON DRAFT MECHANISM OF A SPINNING MACHINE

Nobugi Ooki, Fujisawa-shi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1970, Ser. No. 3,081
Int. Cl. D01h *5/88*
U.S. Cl. 19—254 9 Claims



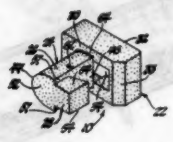
An improved supporting mechanism for supporting a weighting-arm type apron draft mechanism of a spinning frame. The apron draft mechanism is supported by a guide arm which is supported by a forwardly sloped bottom plate of a support secured to a common carrier arm in a three-dimensionally turnable condition together with a slidable condition toward a longitudinal direction of the guide arm.

3,665,560

PLASTIC STRING FASTENER HAVING DETACHABLE PARTS

John L. Bennett, Dayton, Ohio, and Charles P. Bonfiglio, Rochester, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 9, 1970, Ser. No. 96,487
Int. Cl. F16g *11/04*
U.S. Cl. 24—136 R 4 Claims



In a preferred form, a string fastener made of a plastic molded material has two detachable and mutually interlocking parts for securing the end strands of a string. A base forming one of the parts includes a center opening. The other part forms a key having a stem connected in axial alignment with the center opening by a frangible membrane which is broken when the stem is inserted into the center opening. A tongue extending from the stem is guided into clamping engagement with the end strands along the center opening whereupon the base and the key are mutually interlocked.

3,665,561

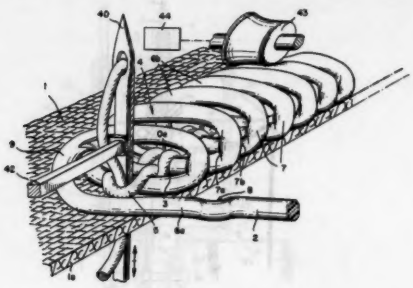
SLIDE FASTENER STRINGER

Helmut Heimberger, Grenzach, Germany, assignor to Opti-Holding AG, Glarus, Switzerland

Filed Nov. 27, 1970, Ser. No. 93,188
Claims priority, application Germany, Nov. 28, 1969, P 19 59 887.9
Int. Cl. A44b *19/12, 19/34*
U.S. Cl. 24—205.1 C 4 Claims

A slide fastener comprises a synthetic-resin monofilament formed into undulations or turns and attached by a chain stitch to the support tape at only the legs lying along this tape. These legs are embraced by the stitches which are in

part shielded by the remainder of the coupling element. The stitches may simultaneously form a filler cord and may be



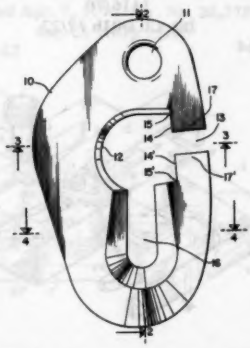
locked in place by clamping of the shanks of the coupling element thereagainst.

3,665,562

HOOK HAVING KEYWAY AT BASE OF ARCUATE THROAT

Roger L. Gower, Rm. 302, 1911 Jefferson Davis Highway, Arlington, Va.

Filed Nov. 18, 1970, Ser. No. 90,735
Int. Cl. A43c *11/08*; A44b *13/00*
U.S. Cl. 24—230.5 **5 Claims**



This invention discloses a hook member having the combined features of a substantially arcuate throat to permit easy passage of chain therethrough and a keyway at the base of the throat for receipt of one link of a length of chain, to secure said chain against further passage through the hook.

3,665,563

CLAMP

John H. Batts, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Mar. 10, 1970, Ser. No. 18,190
Int. Cl. A44b *21/00*
U.S. Cl. 24—258 **10 Claims**

This application discloses a one-piece, molded, plastic clamp having a pair of side or clamping members joined along one edge by a thin web of the plastic which serves as a hinge. The clamp is molded with the two clamping members arranged at approximately 180°, that is, in tandem in the same plane. One of the clamping members has an integral latch finger and the other clamping member has a integral keeper means which engages the latch to lock the clamping members together in clamping or closed position. Means are provided which form an endwise open passageway adjacent the hinge when the clamp is closed, through which a support-

ing rod can be inserted. The entire clamp is so designed that it can be molded as a complete product in a two-piece mold without the use of cams.

3,665,564

THREE-FOLD METAL FITTING FOR ADJUSTING STEPLESSLY THE LENGTH OF A WATCH BAND

Motoo Oka, Urawa, Japan, assignor to Kabushiki Kaisha Bambi, Tokyo, Japan

Filed June 2, 1970, Ser. No. 42,754
Int. Cl. A44c *5/18*
U.S. Cl. 24—265 **8 Claims**

A three-fold metal fitting for a watch band capable of adjusting steplessly a length of the watch band, comprising an upper and a lower metal fittings, one strap and the other adjustable strap of the watch band being fixed thereto, respectively, and a first and a second foldable connecting plates pivotably mounted at each one end to each other and at each other end to the upper and the lower metal fittings, respectively, wherein the two metal fittings are constructed to come into contact with each other at a time of joining while the pivotably mounted portions of the foldable connecting plates being accomodated in the whole metal fitting, and fastening of the straps is carried out within the internal space defined by the upper and the lower metal fittings, especially the adjustable strap being optionally positioned by guiding it along the internal surface of the second foldable connecting plate fixed to the lower metal fitting.

3,665,565

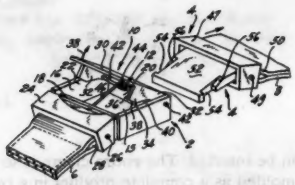
CLASP FOR BRACELETS AND THE LIKE

Stanley Kruger, 223-46 56 Road, Bayside, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,418
Int. Cl. A44c *5/18*
U.S. Cl. 24—265 **15 Claims**

A clasp for securing together two objects, such as the two ends of a bracelet, comprises a housing and a connecting element adapted to be slid into the housing. The housing carries a catch which engages with the connecting element to retain the latter in the housing. The act of releasing the catch cams

the connecting element outwardly from its connected position, the connecting element nevertheless being frictionally



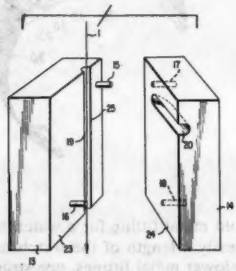
retained within the housing, from which it can be separated by a subsequent and separate action.

3,665,566

APPARATUS FOR THE MANUFACTURE OF TEXTURIZED THREADS

Gabriel Ohayon, Lyon, France, assignor to Societe Rhodiaceta

Filed Feb. 12, 1970, Ser. No. 10,858
Claims priority, application France, Feb. 12, 1969, 6903310
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 **5 Claims**



An apparatus for the continuous high speed manufacture of texturized thermoplastic threads employing a fluid which apparatus comprises two assembled blocks of simple geometric form which blocks have therein two conduits in communication with each other. The first of the conduits is constituted by a longitudinal groove extending throughout the entire length of one side of one of the blocks and the second conduit constitutes a groove completely within one side of the other block so that when the blocks are assembled with the conduits facing each other the conduit in the second block is disposed at an angle to the first conduit.

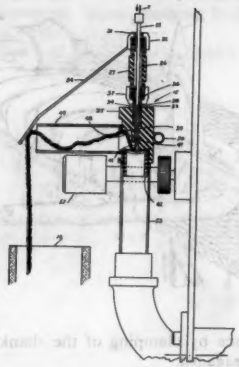
3,665,567

YARN REBOUND TEXTURING APPARATUS AND METHOD

Robert J. Clarkson, Winnsboro, S.C., assignor to Uniroyal, Inc., New York, N.Y.

Filed Apr. 23, 1970, Ser. No. 31,206
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 **40 Claims**

A thermoplastic yarn texturing machine and method is disclosed in which a yarn to be textured is hurled longitudinally by a heated fluid jet against a foraminous surface and rebounded therefrom in a continuous strand-like stream. The thus compressed yarn is collected without subjecting it to any



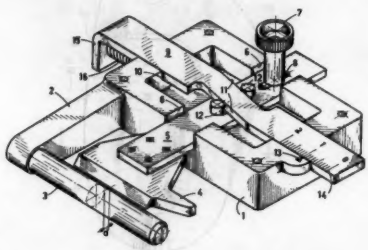
substantial longitudinal tension, then heated and subsequently cooled to heat set the crimp in the yarn, and finally it is wound-up.

3,665,568

THREAD GAUGING APPARATUS

Jakob Stapfer, Adliswil, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Jan. 15, 1971, Ser. No. 106,846
Claims priority, application Switzerland, Jan. 27, 1970, 1116/70
Int. Cl. D01h *13/22*
U.S. Cl. 28—64 **8 Claims**



Thread is passed over a guide pin; a knife blade is spaced accurately by a predetermined distance from the guide pin, the distance determining the maximum size and gauge of the thread. To locate the distance, and provide for accurate placement of the knife blade, the blade is made movable in a path back and forth by a camming member which has a large distance of movement with respect to the movement of the knife blade, so that widely spaced markings can be used to easily identify the accurate position of the knife blade with respect to the pin.

3,665,569

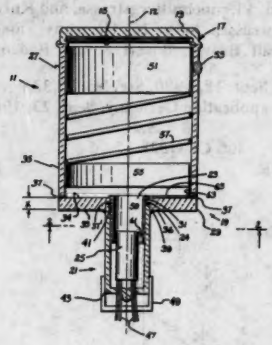
METHOD AND APPARATUS FOR FABRICATING A CATHODE RAY TUBE ENVELOPE HAVING AN ANNULAR SHAPED REAR WINDOW

Chris F. Bossers, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.

Original application Dec. 20, 1968, Ser. No. 785,647, now Patent No. 3,551,973. Divided and this application Aug. 6, 1970, Ser. No. 61,610
Int. Cl. H01j *9/18*
U.S. Cl. 29—25.13 **8 Claims**

A method and apparatus for fabricating a rear-window cathode ray tube envelope having a longitudinal axis

therethrough. The envelope is formed by hermetically sealing a bulb portion and a tubular neck section to a substantially annular shaped optical access window oriented in substantially symmetrical relationship to the longitudinal axis of the tube to provide a substantially annular viewing area for observing the electron impinged side of the screen.

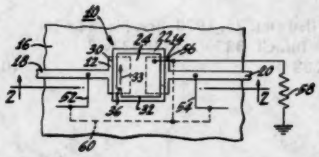


3,665,570

METHOD FOR MONITORING THE CAPACITANCE OF A CAPACITOR WHILE ADJUSTING ITS CAPACITANCE

Robert Lee Brooks, Indianapolis, Ind., assignor to RCA Corporation

Filed Apr. 7, 1970, Ser. No. 26,375
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **5 Claims**



The capacitance of a planar capacitor, having a common plate separated from two bottom plates by a dielectric material, is monitored with an AC-capacitance bridge while the common plate is trimmed with an abrasive material until the capacitor acquires a desired value of capacitance. An electrostatic charge formed on the common plate by the trimming operation is discharged to ground via a high resistance path so as not to interfere with the monitoring operation. A pair of probes connected to monitoring apparatus and a probe for connecting the high resistance path to the common plate are physically connected to a common support for applying the probes to the capacitor simultaneously.

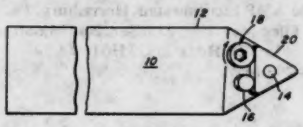
3,665,571

CUTTING INSERT HOLDER

Hubert J. Dupuis, Warren, Mich., assignor to Carmet Company, Pittsburgh, Pa.

Filed Apr. 27, 1970, Ser. No. 31,913
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **1 Claim**

Described herein is a combination of a cutting insert and holder therefore. The novel holder includes a shank and an indexing post connected to the shank which can receive an indexable insert and means, such as a cam, to secure an indexable insert, when positioned on the indexing post in cutting position.

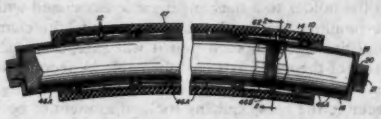


3,665,572

ROLL WITH BEARING SUPPORT MEANS

J. Douglas Robertson, Taunton, Mass., assignor to Mount Hope Machinery Company, Taunton, Mass.

Continuation-in-part of application Ser. No. 875,865, Nov. 12, 1969, now abandoned. This application Oct. 16, 1970, Ser. No. 81,272
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 AD **21 Claims**



A roll having a curved stationary axle carries a series of bearings which rotatably mount a roller sleeve. The bearings, which have to fit the axle loosely, are held firmly in place by an axial stack of annular spacer collars and axially-compressible spring spacers, which apply a controlled compression. Optionally, deformable cushioning rings are compressed against the bearings by the collars. The cushioning rings may be made of a material which is either compressible or incompressible; the spacers have expansion chambers at their ends to accommodate deformation of the rings if these are incompressible.

3,665,573

METHOD OF FABRICATING A HEAT PIPE

Richard W. Werner, Danville; Everette E. Alexander, Dublin, and Irving J. Comstock, Livermore, all of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 18, 1970, Ser. No. 38,219
Int. Cl. B21d *53/02;* **B23p** *15/26*
U.S. Cl. 29—157.3 B **6 Claims**

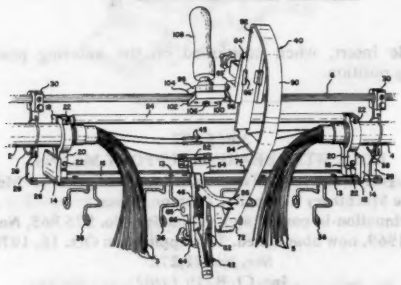
A tube is provided having a plurality of closely spaced very thin longitudinal fins projecting into its interior. The tube is particularly useful as a heat pipe, the capillaries defined between adjacent fins serving as a wicking structure for conveying a heat transfer working fluid from one region of the pipe to another by capillary pumping. Fabrication of the internally finned tube is accomplished by a sacrificial mandrel method.

3,665,574

TOOL HOLDER FOR CABLE SPLICING TOOL

Christopher Kingsley Brown; Carmen Achille Cea, and Thomas Parkison Warne, Jr., all of Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 19, 1970, Ser. No. 38,660
Int. Cl. H05k *3/32;* H01r *43/04*
U.S. Cl. 29—203 MW 6 Claims



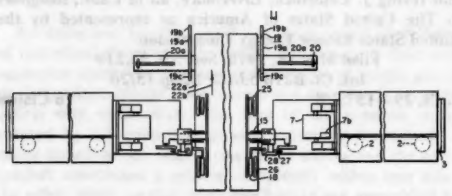
Tool Holder for Cable Splicing Tool has clamping means to clamp the holder to a messenger cable associated with the cable. Suspending arm is adjustably secured to the clamping means and has a length such that it will extend laterally or transversely of the cable axis past the cable. A second clamping means is provided on the end of the suspending arm which receives the cable splicing tool, adjustment of both the suspending arm and the tool being permitted in both a rotational sense and an axial sense so that any desired attitude of the tool can be achieved.

3,665,575

APPARATUS FOR INSERTING ELECTRODE RODS INTO POCKETS OF DOUBLE-WEB MATS FOR STORAGE BATTERIES

Josef Sucher, Hagen, and Oswald Segieth, Schwelm, both of Germany, assignors to Varta Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 5, 1970, Ser. No. 87,271
Claims priority, application Germany, Nov. 11, 1969, P 19 56 569.6
Int. Cl. H01m *37/00*
U.S. Cl. 29—204 D 20 Claims



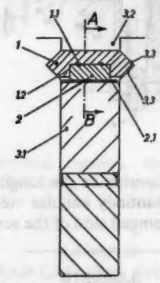
An apparatus for inserting contour rods into the pockets of double-web mats for storage-battery electrodes comprises a contour-rod magazine with dispensing means for releasing one rod at a time. A spreader device opens the pockets of the mat. Catch and guide means then engage the released rod and partially insert it into a pocket then spread open. Further transport means engage the partially inserted rod and completely shove it into the mat pocket. A control mechanism operates to actuate the above-mentioned component devices of the apparatus in the sequence described. Preferably two rod inserting apparatus are arranged on opposite sides of the double-web mat for simultaneously inserting respective contour rods from opposite sides into the pockets.

3,665,576

MEANS FOR SECURING THE COILS OF AN ELECTRIC MACHINE IN THE SLOTS OF THE IRON BODY THEREOF AND DEVICE FOR INTRODUCING THE MEANS IN THE SLOTS

Harald Nordmann, Viernheim/Bergstrasse, and Kurt Schmidt, Bensheim/Bergstrasse, both of Germany, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Sept. 18, 1970, Ser. No. 73,333
Claims priority, application Germany, Sept. 23, 1969, P 19 48 025.2
Int. Cl. H02k *15/06*
U.S. Cl. 29—205 R 10 Claims



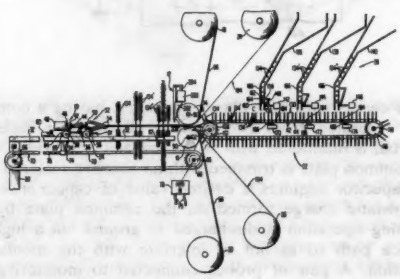
Coils are secured in the slots of the iron body of an electric machine by means of cooperating wedges which are pressed or moved into place by fluid pump means or by mechanical means.

3,665,577

APPARATUS FOR MANUFACTURING ARTIFICIAL SHRUBS

Percy Dieffenbach, Blakely, Pa., assignor to Masterpiece, Inc., Blakely, Pa.

Filed Oct. 21, 1970, Ser. No. 82,676
Int. Cl. B23p *19/04;* B23g *7/10*
U.S. Cl. 29—208 D 10 Claims



Laterally spaced endless conveyor chains carry slotted members on the individual links. Selected slots receive a varying number of shrub limbs of varying length which are in turn discharged into the nip between two stiffly flexible wires or they are removed from storage reels and intertwisted. A rotary chuck on a reciprocating carriage selectively grasps the ends of the wires and moves the same longitudinally in synchronism with the endless conveyor which discharges the limbs in between the wires. Rotating the chuck causes the wires to intertwist capturing the limbs at space locations defined by their position on the endless chain conveyors. After pulling and intertwisting the wires to a desired length up to 15 feet or more, the intertwisted wires are severed just

behind the wire guide pulleys thereby producing a completely assembled shrub.

Narrow webs are simultaneously fed between the intertwisted wires and captured limbs to define the simulated trunk for the shrub. Actuators carried by the endless chain conveyors contact stationery microswitches to energize solenoids for respective gravity operated chutes controlling the feed of limbs which vary both in length and number into the slots.

3,665,578

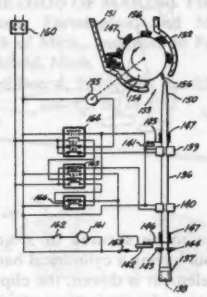
O-RING MOUNTING MACHINE

Robert D. Jaquette, Charlotte, Mich., assignor to Air-Way Manufacturing Company, Olivet, Mich.

Filed May 18, 1970, Ser. No. 37,955

Int. Cl. B23q *7/10*; B23p *19/02*

U.S. Cl. 29—211 R **7 Claims**



An apparatus is provided for mounting O-rings on male members such as pipe fittings, the apparatus comprising a substantially cylindrical mandrel of circular cross-section and of a diameter adapted to receive a supply of O-rings, and being flared at one end and having an axial chamber provided in said flared end adapted to receive the end of the male members. The mandrel is suitably mounted on a frame and is provided with a finger assembly which upon actuation receives an individual O-ring and moves it axially over the flared portion and causes it to be released therefrom and mounted onto the male member at a position provided therefor. Means is provided for automatically feeding O-rings over the small end of the mandrel while the apparatus is in operation.

3,665,579

PIPE TOOL

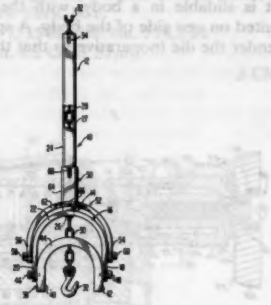
Robert Francis Jaeger, 7264 Edwards St., New Orleans, La., and Ernest Frederick King, Jr., 4212 Wichita St., Metairie, La.

Filed Oct. 24, 1969, Ser. No. 869,049

Int. Cl. B23d *19/04*

U.S. Cl. 29—237 **12 Claims**

Pipe joining and disjoining tool which includes an operating lever having a yoke at one end. Another yoke is pivoted to the yoke on the operating lever, for mounting the tool on one of the pipes to be joined. A chain is secured to the other pipe, and extends upwardly through a passageway in the operating lever. To join the pipes, the chain is tautened and locked in a slot at the top of the operating lever, which is then swung downwardly to tightly draw the pipes together. For disjoining pipes, the tool includes a disjoining member having a third yoke which is mounted on the yoke on the operating lever and which can be pivotally moved away from the operating lever. The chain is pulled taut and is locked in a slot in the disjoining member, and the pipes are disjoined



by swinging the operating lever in a direction opposite the direction of swinging for joining the pipes.

3,665,580

CLIP APPLICATOR

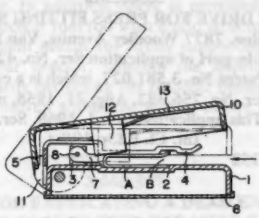
Saburo Mashita, Fujioka, Japan, assignor to Max Company Limited, Tokyo, Japan

Filed Mar. 19, 1970, Ser. No. 21,129

Claims priority, application Japan, Mar. 24, 1969, 44/26064

Int. Cl. B23p *11/00*

U.S. Cl. 29—243.56 **11 Claims**



This invention relates to a clip applicator that can firmly fasten together sheets of paper and other matters to be clipped without causing damage thereto through a mechanical and continuous clipping operation. It consists of a base with a guide groove, which is capable of being loaded with a stick of clips, whereon there is attached a cover that guides the stick of clips. And to said base or cover is attached a handle fitted with a press plate that pushes the foremost piece of the stick of clips to separate said piece of clip from the stick and deform it by pressing for fastening. The mechanism of this clip applicator is that the handle, when pushed, sends the press plate into the bendable end of the stick of clips to separate a clip from the stick and deform it by pressure of the press plate, thus firmly fastening together, from the both sides, sheets of paper etc. inserted into the opening part of the clip.

3,665,581

FLARING TOOL

Bulent Gulistan, Malibu, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif.

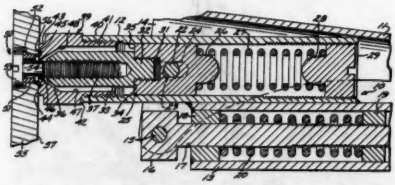
Original application Nov. 29, 1968, Ser. No. 784,527, now Patent No. 3,561,093, which is a continuation-in-part of application Ser. No. 744,260, June 13, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 578,728, Sept. 12, 1966, now abandoned. Divided and this application July 29, 1970, Ser. No. 59,273

Int. Cl. B23p *11/00*

U.S. Cl. 29—243.52 **13 Claims**

A flaring tool including a die adapted to engage the end of a sleeve and an element adapted to grip the shank of a

fastener extending through the sleeve, with a tension force being applied to the shank and an inward force being applied to the die through the actuation of a lever. The gripping element is slidable in a body, with the lever being pivotally mounted on one side of the body. A spacer may be provided to render the die inoperative so that the tool may be used to



force an interfering part into an opening in the workpiece without simultaneously bending the flange. Such a part may be a nut with a knurled exterior that becomes embedded in the workpiece to prevent the nut from rotating. A member may be substituted for the die to exert a pull on a fastener attached to the workpiece for accomplishing removal of the fastener.

3,665,582

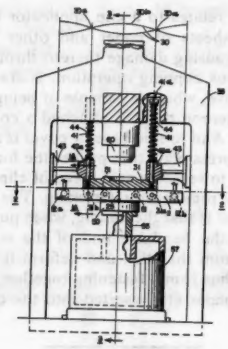
SONIC DRIVE FOR PRESS FITTING SYSTEM

Albert G. Bodine, 7877 Woodley Avenue, Van Nuys, Calif.

Continuation-in-part of application Ser. No. 423,771, Jan. 6, 1965, now Patent No. 3,581,027, which is a continuation of application Ser. No. 756,382, Aug. 21, 1958, now Patent No. 3,169,589. This application Oct. 1, 1969, Ser. No. 862,905

Int. Cl. B23p *19/04*

U.S. Cl. 29—252 **7 Claims**



An elastic beam member is vibrationally driven by orbiting-mass oscillator means so as to set up a standing wave pattern therein. Means are provided to support the beam at points therealong where nodes of the standing wave appear. The beam is coupled to members to be press fitted together at one or more points therealong lying between the node and antinode of the standing wave pattern, this point being chosen to provide an optimum impedance match between the beam and such members. Means are provided to mechanically urge the members together, while sonic energy is simultaneously applied to the interface therebetween to implement the press fitting action.

3,665,583

SUSPENSION CLIP STRUCTURE AND APPARATUS AND METHOD FOR SECURING SAME TO A WORK SURFACE

James F. Helderman, York, Pa., assignor to Ladd Tool Company, Inc., Wilmington, Del.

Filed May 9, 1968, Ser. No. 727,985

Int. Cl. B25c *1/10;* **B23q** *3/16;* **B23p** *11/00*

U.S. Cl. 29—254 **15 Claims**

A clip structure to be secured to a work surface by a power actuated tool having a cylindrical barrel member from which a fastener element is driven, the clip structure including a center portion and a projecting retaining flange having spaced corners engaging the side wall of the barrel member at at least two peripheral points thereon having a chordal spacing less than the diameter of the barrel member, and including a projecting attachment flange engaging the barrel member side wall substantially oppositely from the engagement by the retaining flange to loosely retain the clip structure on the barrel member, the attachment flange including a leg portion extending outwardly from the barrel member for pre-assembly with a hanger wire that will not interfere with subsequent disposition of the clip structure on the barrel member. The center portion of the clip structure may be apertured to engage the tip end of the stud element extending outwardly from the barrel member of certain types of tools. Additionally, the tool may be provided with an extension element whereby the tool, with a clip structure placed thereon, may be manipulated to locate the clip structure against a ceiling and then actuated by a workman standing on the floor beneath the ceiling, the preassembled hanger wire depending vertically from the clip structure to form a plumb line providing vertical reference for aligning the tool therewith.

3,665,584

METHOD AND APPARATUS FOR MAKING FLEXIBLE STRIPS OF MATERIAL HAVING A PILE OF HOOK-SHAPED ELEMENTS

George H. Erb, Rutland, Vt., assignor to American Velcro, Inc.

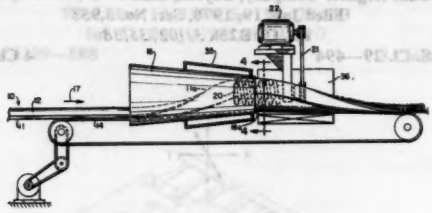
Filed Nov. 18, 1970, Ser. No. 90,710

Int. Cl. B21d *53/52;* **B23p** *13/04*

U.S. Cl. 29—410 **7 Claims**

A method is disclosed for making the hook or loop part of a separable hook and loop type fastener by bending a flexible base strip having a plurality of unbroken hook-shaped rails protruding from one surface thereof into a generally tubular form with the rails extending radially inwardly thereof; and

thereafter progressively subjecting spaced-apart cross-sectional segments of each rail alternately and periodically to a



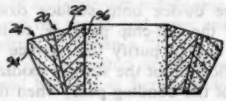
rotational cutting action to transform each rail into a row of individually spaced-apart resilient hooks or loops.

3,665,585

COMPOSITE HEAVY-DUTY MECHANISM ELEMENT AND METHOD OF MAKING THE SAME

William M. Dunn, Farmington, and Myron C. Sarnes, Northville, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Dec. 4, 1970, Ser. No. 95,299
Int. Cl. B22f 3/12
U.S. Cl. 29—420 **6 Claims**



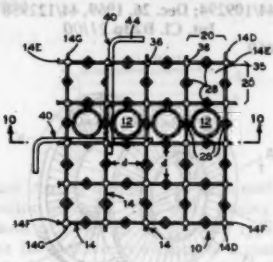
A composite mechanism element, such as a bevel pinion (FIGS. 1 to 6 inclusive), or the inner race of a tapered roller bearing (FIGS. 7 to 10 inclusive and 16) has its working or load-bearing portion or portions composed of sintered powdered high-performance alloy while its supporting portion not subjected to concentrated or heavy loads, is made of a base metal, such as sintered powdered iron. The toothed outer load-bearing portion of the composite bevel pinion (FIG. 6) and the hollow frusto-conical inner supporting portion (FIGS. 10 to 15) are separately briquetted from high performance alloy powder and low performance metal powder respectively and separately sintered after which the low performance inner supporting portion is pressed into the high performance toothed outer portion so as to be inseparably secured thereto. In the inner race (FIG. 15) of the composite tapered roller bearing (FIG. 16) the low-performance and high-performance portions of the inner race are separately compacted in dies in a briquetting press to form briquettes which are separately sintered and thereafter are pressed together in an assembling operation which causes the high performance and low performance portions of each race to be inseparably secured to one another. The composite outer race is formed by arranging base metal powder and high performance alloy powder in abutting zones in an annular cavity of a briquetting press die and compressing them to form a composite briquette which is then sintered and afterward deformed in a forging die into its final annular shape. The resulting composite sintered powdered mechanism elements are of much lower material cost than corresponding mechanism elements formed of high performance alloy throughout yet perform satisfactorily and have sufficient strength and durability for most purposes. The tapered roller bearing races (FIG. 9) or the bevel pinion (FIG. 15) may be used as they are if of satisfactory density for their intended uses, or they may be further densified by being subjected to an additional hot forging operation with the article sintered thereafter if deemed necessary.

3,665,586

NUCLEAR FUEL ROD SUPPORTING ARRANGEMENTS

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Nov. 7, 1968, Ser. No. 774,148
Int. Cl. G21c 21/00
U.S. Cl. 29—428 **3 Claims**



A combination of a frame for holding a movable nuclear fuel bearing member in place within a nuclear reactor, wherein the frame includes at least one open-ended cell which forms a passageway within which the member may be held and resilient means for holding the member within the passageway; and means for temporarily enlarging the passageway to enable the member to be freely moved within the passageway. In addition, there is provided a method of assembling a nuclear fuel rod with a grid structure of the type which has resilient means for firmly supporting the fuel rod within a nuclear reactor, wherein the improvement comprises, temporarily deflecting the resilient means to allow the fuel rod to be moved within the grid structure without being fretted thereby.

3,665,587

PROCESS FOR FABRICATING A DEAD END OF THE SPELTER SOCKET TYPE FOR WIRE CABLES

Randolph C. H. Michaelsen, Malibu, Calif., assignor to Global Marine Inc., Los Angeles, Calif.

Original application Dec. 5, 1968, Ser. No. 781,570, now Patent No. 3,568,265, dated Mar. 9, 1970. Divided and this application Mar. 13, 1970, Ser. No. 24,411
Int. Cl. B23p 25/00
U.S. Cl. 29—461 **3 Claims**

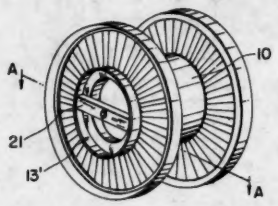
A collar having a plurality of wire strands is attached to a spelter socket after the latter is poured around a splayed end of a wire cable. The wires are braided around the wire cable to enhance the cable's fatigue life.

3,665,588

METHOD FOR MANUFACTURE OF WIRE REEL PROVIDED AT ITS ENDS WITH CORRUGATED FLANGES

Toru Mizuguchi; Mitsuo Fujita, and Yoshiaki Suzuki, all of Yokohama, Japan, assignors to The Furukawa Electric Company Limited and Toko-Kogyp-Kabushiki Kaisha

Filed Nov. 18, 1970, Ser. No. 90,697
Claims priority, application Japan, Nov. 19, 1969, 44/92155; 44/109294; Dec. 26, 1969, 44/122958
Int. Cl. B23p *21/00*
U.S. Cl. 29—469 7 Claims



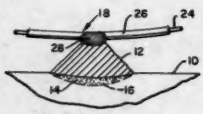
A method for manufacture of wire reel provided at its ends with corrugated flanges utilizing two pairs of rollers and a U-shaped annular body. A metal band is fed between one pair of rollers each having corrugations on its surface in parallel with its axis arranged perpendicular to the side edges of the metal band to form a corrugated band while one side edge of the corrugated band is fed between another pair of rollers each having a smooth surface to deform the corrugated side edge into a flat surface whereby to form an annular corrugated flange. The U-shaped annular body is provided at its one leg portion with an annular projection bent perpendicular thereto. The inner peripheral edge of the corrugated flange is clamped together with the two leg portions of the U-shaped annular body by a press and a drum is secured to the annular projection thus constructing a wire reel.

3,665,589

LEAD ATTACHMENT TO HIGH TEMPERATURE DEVICES

Richard Farrell, Lowell, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 23, 1969, Ser. No. 868,775
Int. Cl. B23k *31/02*
U.S. Cl. 29—492 2 Claims



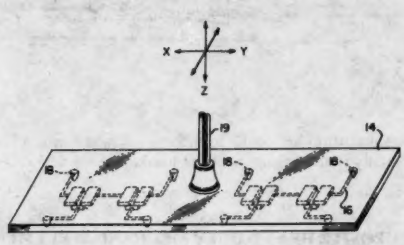
A technique for the attachment of leads to electronic devices which permits operation of the devices over a wide temperature range. The technique contemplates the use of core conductors having a thin coating of metal thereon whereby only a limited amount of coating material is available to form an alloy which bonds the core conductor to the device electrode, the electrode composition thus being effected only in the region adjacent the lead and the bond between the electrode and device being unaffected.

3,665,590

SEMICONDUCTOR FLIP-CHIP SOLDERING METHOD

John O. Percival, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Jan. 19, 1970, Ser. No. 3,955
Int. Cl. B23k *31/02, 35/38*
U.S. Cl. 29—494 4 Claims



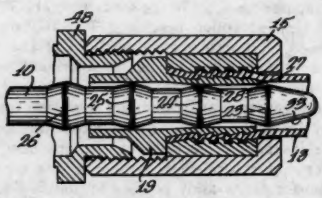
The present disclosure relates to a method of reliably soldering a semiconductor flip-chip to a semiconductor flip-chip package. A hot reducing gas is passed through a reducing gas guidance device onto surface oxidized solder which is upon the electrodes of the flip-chip, to melt the surface oxidized solder and to purify the surface oxidized solder. Simultaneously, the hot reducing gas is also passed through the reducing gas guidance device onto surface oxidized solder on bonding pads of the flip-chip package, to melt this surface oxidized solder and to purify this surface oxidized solder. Due to the purification of the surface oxidized solder of the electrodes and of the bonding pads, when the solder on the electrodes and of the bonding pads is brought together, the purified solder easily coalesces together. This method produces reliable electrical connections between a semiconductor flip-chip and a semiconductor flip-chip package.

3,665,591

METHOD OF MAKING UP AN EXPANDABLE INSERT FITTING

Leonard J. Kowal, Prospect Heights, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Filed Jan. 2, 1970, Ser. No. 127
Int. Cl. B21d *39/00;* B23p *11/02*
U.S. Cl. 29—507 7 Claims



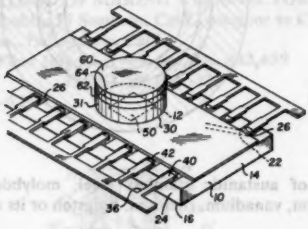
A method of making-up a fitting having a deformable insert adapted to be disposed coaxially within a tube end. The insert is expanded by a punch having spaced annular swaging portions of progressively increasing diameter whereby successive enlarging operations are effected as a result of an axial movement of the punch through the insert. The punch includes a shaft with the annular swaging portions being formed integrally with the shaft. The enlarging portions may be uniformly axially spaced to assure the action of only a single swaging portion on the insert at a given time.

3,665,592

CERAMIC PACKAGE FOR AN INTEGRATED CIRCUIT

Nick J. Apospors, Stamford, Conn., assignor to Vernitron Corporation, Great Neck, N.Y.

Filed Mar. 18, 1970, Ser. No. 20,713
Int. Cl. B01j 17/00; H01l 1/10
U.S. Cl. 29—588 3 Claims



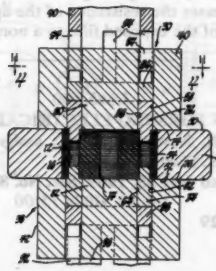
A ceramic package for an integrated circuit includes a ceramic plate having a central recess. A screened circuit pattern of spaced conductive stripes of molybdenum manganese is applied to the plate and fired to metallize it. A coating of aluminum oxide is applied over the plate and parts of the stripes and a ring of molybdenum manganese is placed on the coating to surround the recess and inner ends of the stripes. The ring is metalized and then a "Kovar" ring is brazed to the metalized ring. An integrated circuit chip is placed in the recess and covered by a cover hermetically bonded to the ring.

3,665,593

METHOD AND APPARATUS FOR MANUFACTURE OF A SQUIRREL CAGE ROTOR

Jack W. Savage, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1970, Ser. No. 26,242
Int. Cl. H02k 15/02, 15/085
U.S. Cl. 29—598 3 Claims



A method and apparatus is provided for manufacturing a squirrel cage winding assembly of a squirrel cage rotor from a pair of hollow cylindrical aluminum slugs wherein the pair of slugs are extruded into opposite ends of the winding slots of a rotor core. Conductor bars are formed in the slots by the extruded slug material and conductive end rings are formed integrally therewith by terminal portions of each slug.

3,665,594

METHOD OF JOINING A BODY OF SEMICONDUCTOR MATERIAL TO A CONTACT OR SUPPORT MEMBER

Kurt Raithel, Uttenreuth, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 6, 1969, Ser. No. 864,121
Claims priority, application Germany, Oct. 17, 1968, P 18 03 489.4
Int. Cl. B23k 31/02, 35/24
U.S. Cl. 29—590 6 Claims

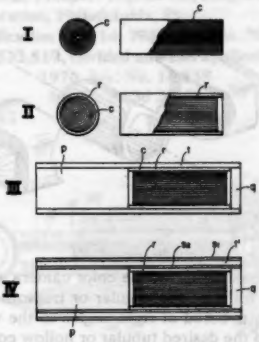
An aluminum coating is applied to a flat surface of a body of semiconductor material. The body having at least two zones or regions of different or opposite type conductivity exposed at the flat surface. A surface of a metal support or contact member which is to be joined to the aluminum coated surface of the semiconductor body is coated with a silicon-aluminum alloy. The two surfaces are then brought together and the surfaces heated to a temperature just above the silicon-aluminum eutectic whereby the body of semiconductor material is joined to support or contact.

3,665,595

METHOD OF MANUFACTURING SUPERCONDUCTIVE MATERIALS

Eihachiro Tanaka; Yutaka Onodera, both of Sendai; Takeji Fukuda, Kanuma; Tsutomu Yamashita, Sendai; Tetsuo Saito, Tokyo, and Shoji Kumia, Hitachi, all of Japan, assignors to The Research Institute for Iron, Steel and Other Metals of The Tohoku University, Sendai, Japan

Filed Oct. 27, 1969, Ser. No. 869,719
Claims priority, application Japan, Oct. 31, 1968, 43/78863; Mar. 19, 1969, 44/20592; 44/20593; 44/20594
U.S. Cl. 29—599 6 Claims



Superconductive materials are manufactured by providing a laminated material by combining a material of Nb, V or Mo metal, or alloy or intermetallic compound thereof and a material of Sn, Al, Zr, Ti, Pb, Ge, V, Si, Ga, C or Au element or alloy thereof, winding the laminated material tightly into a coil, covering the coiled body with a shielding layer composed of Nb, Ta or Zr metal or alloy thereof or stainless steel, inserting the coil covered with the shielding layer into a sheath composed of Cu, Al, Ag, Au or Cd metal, or alloy or intermetallic compound thereof or stainless steel, subjecting said sheath enclosing said coil and said shielding layer to a

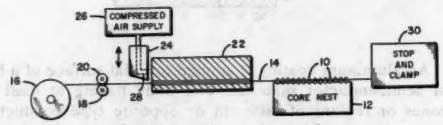
treatment for reducing a cross-sectional area of said coil and heat-treating thus treated coil. The laminated material may be inserted into the sheath together with a mechanically reinforcing material in order to improve the strength of the resulting superconductive materials.

3,665,596

MAGNETIC CORE WIRING MACHINE

Dixon A. Ford, Farmington, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 20, 1970, Ser. No. 4,252
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 **9 Claims**



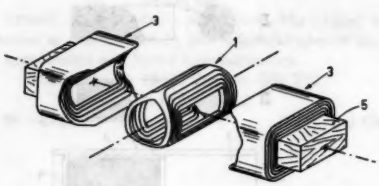
A machine for automatically inserting the drive conductors in a magnetic core memory array. The cores to be threaded are first located in a core nest to form an array of rows and columns of cores. The wires to be threaded through the apertures in the toroidal cores are automatically loaded into elongated channels or barrels and subsequently, a jet of compressed gas is applied to the ends of the wires in the barrels which forces the wires out of the barrels and through the core array.

3,665,597

DEFLECTION COIL ASSEMBLY

Sing Liong Tan; Mathijs Willem Bartels, and Walter Wilhelmus Johannus Degger, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,372
Claims priority, application Netherlands, Oct. 3, 1969, 6915054
Int. Cl. H01f *7/06*
U.S. Cl. 29—605 **4 Claims**



Deflection coil pair for the color camera wound from insulated metal foil to a rectangular or trapezoidal block, which after baking is bored at right angles to the winding axis and machined to the desired tubular or hollow conical shape.

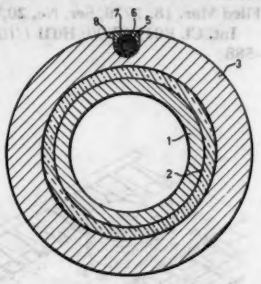
3,665,598

METHOD OF MAKING A HEATING BODY

Meindert Willem Brieko, Diepenbrockstraat 1, Schagen, Netherlands

Filed Dec. 17, 1970, Ser. No. 99,048
Int. Cl. H01v *11/00*
U.S. Cl. 29—611 **1 Claim**

Electrical resistance heating conductor, surrounded by an electric insulating cylindric layer of borium nitride or beryllium oxide, coated off by outward heat dissipating liner. Between conductor, intermediate layer and outward liner are at all times shrinking fits sustained. Conductor and liner



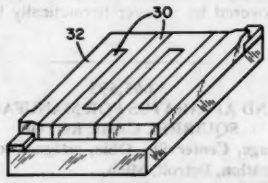
consist of austanitic stainless steel, molybdenum, nickel, chromium, vanadium, rhenium, tungsten or its alloys.

3,665,599

METHOD OF MAKING REFRACTORY METAL CARBIDE THIN FILM RESISTORS

Andrew Herczog, Painted Post, N.Y., and Harold R. Smith, Denver, Colo., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 27, 1970, Ser. No. 32,254
Int. Cl. H01c *7/00, 17/00*
U.S. Cl. 29—620 **20 Claims**



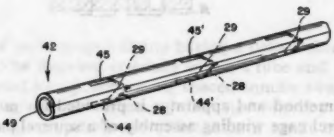
The resistance value of a refractory metal carbide film resistor is adjusted and stabilized at any desired resistance value up to approximately 100 times the resistance value of the originally deposited film by heat treating the metal carbide film in an oxidizing atmosphere at temperatures above the anticipated operating range of the resistor. The heat treatment increases the resistance of the applied film by converting a layer of the exposed film to a non-conductive oxide.

3,665,600

METHOD OF FORMING ELECTRICAL CONNECTORS

Bartley E. Hall, Newtown, Conn., assignor to Auto-Swage Products, Inc., Shelton, Conn.

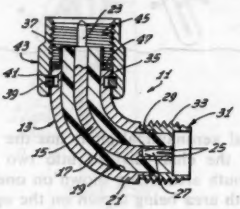
Filed July 25, 1969, Ser. No. 845,024
Int. Cl. H02g *15/00*
U.S. Cl. 29—629 **10 Claims**



A method is disclosed for forming electrical connectors in individual and strip form. The connector is formed from a

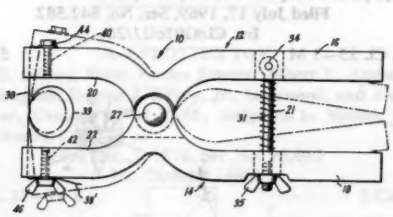
metal strip by punching from the strip two fingers which are integrally connected to the strip at the fingers' base. The fingers are bent about their bases so that they overlie the material of the strip. The strip is then tubulated so that the fingers extend into the hollow of the tubulated strip. The tubulated strip is shaped by a die swaging technique to form a top connector portion and a bottom nose portion. Waste material is removed to form a finished electrical connector.

3,665,601
METHOD OF MAKING A CONNECTOR
John G. Dunbabin, El Segundo, Calif., assignor to Connecting Devices, Inc., El Segundo, Calif.
Filed July 22, 1969, Ser. No. 843,459
Int. Cl. H02g *15/00*
U.S. Cl. 29—629 **15 Claims**



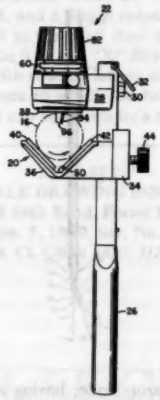
A method of making a connector comprising bending a tube to form a bend portion and forcing a plurality of balls through the passage in the tube to appropriately shape the cross section of the passage. An insulator and inner conductor are forced into the bent tube with the tube forming a die for shaping of the insulator and inner conductor.

3,665,602
HAND CUTTING TOOL
Hooshang Salahshourian, Fairfield, Conn., assignor to General Electric Company
Filed Mar. 15, 1971, Ser. No. 123,984
Int. Cl. B26b *27/00*
U.S. Cl. 30—90.1 **3 Claims**



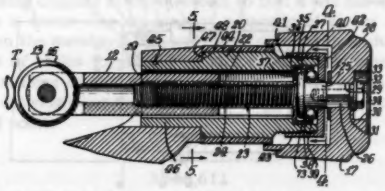
This invention relates to a hand cutting tool especially applicable for cutting a taped layer from an insulated cable. The cutting tool comprises a pair of elongated lever members pivotally connected to each other intermediate their ends. The lever members include a pair of handles at one end and arched upper and lower jaws at the other end opposite the handles. A spring wire having a looped portion therein is disposed between and connected to the upper and lower jaws.

3,665,603
CABLE STRIPPING TOOL
Robert A. Bilbrey, 21 Monte Vista, Orinda, Calif., and Robert V. Van Gelder, 2739B Fulton Street, Berkeley, Calif.
Filed Dec. 11, 1969, Ser. No. 884,278
Int. Cl. H02g *1/12*
U.S. Cl. 30—90.7 **12 Claims**



A manually held and manually operated tool for stripping the insulation from large diameter electric cables. The tool includes a member for supporting a range of different diameter cables in the tool while permitting rotation of the tool relative to the cable. The tool includes an insulator cutting blade whose depth of cut may be selectively varied and whose angular disposition relative to the cable may be selectively changed so as to permit the cutting of a spiral track through the insulator without the application of any axial pressure and which likewise permits the ends of the track to be squared.

3,665,604
TUBE CUTTER
Leonard J. Kowal, Prospect Hights, Ill., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.
Original application Feb. 14, 1968, Ser. No. 705,541, now Patent No. 3,522,617. Divided and this application Feb. 16, 1970, Ser. No. 14,838
Int. Cl. B23d *21/08*
U.S. Cl. 30—102 **7 Claims**



A tube cutter for manually cutting tubing by means of a cutting wheel forced against the outer wall of the tubing and moved circumferentially thereabout. The cutting wheel is mounted on a holder which is selectively movable forwardly and rearwardly by a manually operable handle to advance and retract the cutting wheel relative to the tube wall. The tube cutter includes a body portion carrying a deburring blade. The blade is pivotally mounted on the body for selective disposition in a retracted position juxtaposed to the body and a deburring position projecting outwardly of the body.

3,665,605
RAZOR-BLADE SCRAPER

Thomas F. Howerter, Fort Collins, Colo., assignor to Carol Company, Fort Collins, Colo.

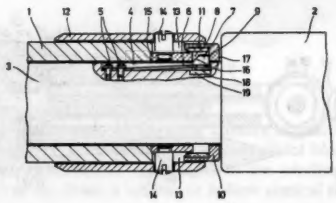
Filed July 24, 1969, Ser. No. 844,278
Int. Cl. B27g *17/04*
U.S. Cl. 30—169 1 Claim

A single-edged razor blade, having an enlarged strip opposite its cutting edge, is received within a bi-furcated clamp so as to lie in a given plane with its cutting edge exposed. An elongated solid rod forms a rigid handle shaped to be grasped over one end portion by the hand of the user. The rod is affixed rigidly at its other end to the rear of the clamp so as to form an angle, between the axis of the handle and the plane of the blade in another plane that includes the axis and is normal to the blade plane, of an amount sufficient to accommodate the user's knuckles between the handle and a surface being scraped while the plane defined by the blade is positioned almost parallel to that surface.

3,665,606
COUPLING FOR THE CONNECTION OF A DENTAL HANDPIECE TO A POWER SOURCE

Martin Saupe, Mittelbiberach, Germany, assignor to Kaltenbach & Voigt, Biberach/Riss, Germany

Filed Apr. 2, 1969, Ser. No. 812,785
Claims priority, application Germany, Jan. 27, 1969, G 69 03 033.7
Int. Cl. A61c *1/08*
U.S. Cl. 32—26 9 Claims

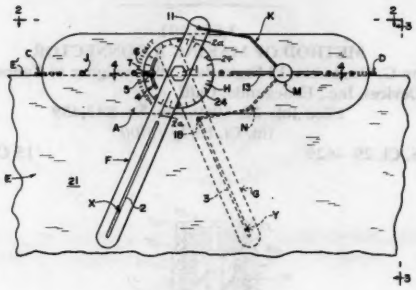


A sleeve of a dental handpiece is connected directly or via an intermediate sleeve to a drive motor by means of the engagement of a hook, mounted on an elastic arm secured to the motor, in an annular groove formed in the sleeve. The hook is selectively displaced from the groove to uncouple the sleeve and motor by axially displacing a shift member, externally mounted on the sleeve, which causes a sliding ring connected with the shift member to pass over the hook and displace the same from the groove against the opposition of the resilient arm.

3,665,607
FLIGHT LINE CONTINUATION PROJECTION DEVICE FOR AIR NAVIGATION

Kenneth D. Clark, 2029 Westover Drive, Pleasant Hill, Calif.

Filed Feb. 24, 1970, Ser. No. 13,527
Int. Cl. B43l *5/00*
U.S. Cl. 33—1 SD 7 Claims

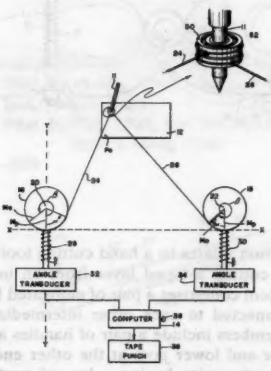


A sectional aeronautical chart has the geographical area bounded by the chart divided into two North and South areas, the South area being shown on one face of the chart and the North area being shown on the opposite chart face. Where a pilot wishes to plot his flying course from a point of departure on one face of the chart to a destination point on the opposite chart face, it is difficult to project the flight line continuation onto the opposite face of the chart and maintain the same angle. My device comprises two arms pivoted together and adapted to receive a sectional aeronautical chart therebetween with one arm overlying one chart face and the other arm overlying the other face and the pivot point contacting the chart edge which is a common border line between the two chart faces. Means is provided for simultaneously swinging the two arms in opposite directions about their common pivot so that the angle of the flight line depicted by the arm overlying one chart face will be continued onto the opposite chart face at the same angle by the other arm that overlies this face.

3,665,608
POSITION-LOCATING SYSTEM

Thomas C. Stockebrand, Boxboro, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

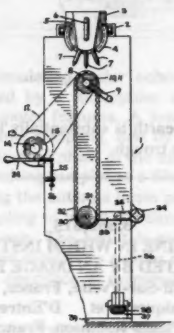
Filed July 17, 1969, Ser. No. 842,582
Int. Cl. G01c *21/20*
U.S. Cl. 33—1 M 5 Claims



A stylus whose position is to be determined is attached to ends of two strings. The other ends of the strings are wrapped

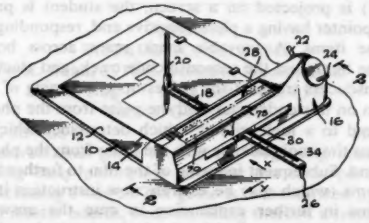
around and attached to a pair of spring-biased, rotatable drums. When the stylus is moved, one or both of the drums rotate to accommodate the change in length of the strings and the angular positions of the drums therefore correspond with the position of the stylus. The drum angles are measured by angle transducers whose outputs are processed by a computer to provide a reading of the stylus position.

3,665,609
APPARATUS FOR MAKING TIMING BELTS
Wilhelm Ganser, North-Rhine-Westphalia, Germany, assignor to Uniroyal Englebert Deutschland AG, Aachen, Germany
Filed Sept. 18, 1970, Ser. No. 73,416
Int. Cl. B43l *13/00*
U.S. Cl. 33—32 C **10 Claims**



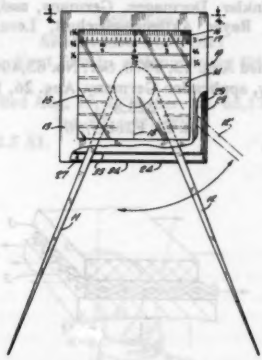
An apparatus is disclosed for the marking of toothed belts at predetermined distances along the belt and in fixed relationship to the belt teeth. A chucking and driving means for holding and positioning the belt to be marked is operably connected with a length measuring wheel so that they can be driven synchronously. The length measuring wheel has recesses corresponding to the points to be marked. A scanning means reads these markings and marking device marks the belts as indicated by the scanning means. The operation can be carried out automatically by means of a switching system working cooperatively with the length measuring wheel. Additional switches may be used to control the type of markings made on the belt blank.

3,665,610
X-Y PLOTTER TOY
Floyd E. Schlau, Palos Verdes Estates; Albert L. Anderson, Los Angeles; Eugene J. Kilroy, Jr., Inglewood, and Alcwyn Flicker, Carson, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 7, 1970, Ser. No. 95,662
Int. Cl. B43l *13/00*
U.S. Cl. 33—18 R **5 Claims**



A toy which enables a child to draw pictures by remote manipulation of a writing instrument, including a frame for supporting a sheet of paper, a marker holder for holding a writing instrument over the paper, and a pair of knobs which can be turned by a child to move the holder in each of two perpendicular directions over the paper. The marker holder is mounted for sliding in the "X" direction on a carriage and the carriage is mounted to move in the "Y" direction on the frame. When a "Y" knob is turned by a child, it rotates a pulley which moves a cord that is attached to the carriage to move it in the "Y" position. When an "X" knob is turned, it rotates a square shaft, and a pinion rotatably mounted on the carriage and coupled to the shaft then moves a rack on the marker holder to slide it in the "X" direction. A program in the form of a strip with rows of letters and numbers defining "X" and "Y" locations to which the holder can be moved, defines a picture that can be drawn by a child.

3,665,611
MULTI-SCALE DRAWING INSTRUMENT
Oscar R. Avila, 98-25 64th Road, Forest Hills, N.Y.
Filed Feb. 5, 1970, Ser. No. 8,828
Int. Cl. G01b *5/00, 3/22*
U.S. Cl. 33—148 R **1 Claim**

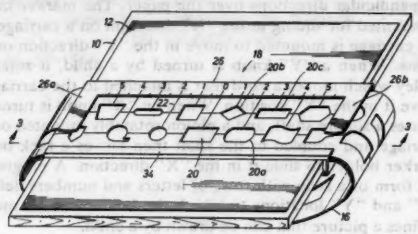


A multi-scale drawing instrument and more specifically dividers having a housing with a pair of elongated pointed members extending therefrom with the members movable one relative to the other, a movable strip of material within the housing and observable through a window therein, the strip being coupled to the members so that it will move relative to a center line an amount proportional to the angle between the members. The strip is provided with a plurality of sets of scales to provide among other measurements a direct reading of the distance between the two points on a scaled drawing when the ends of said members are positioned on said points.

3,665,612
CONTINUOUS TEMPLATE FLOW CHARTING APPARATUS AND METHOD
Daniel M. Albright, 107 Sycamore, Lake Jackson, Tex.
Filed Nov. 4, 1970, Ser. No. 86,742
Int. Cl. B44d *3/32*
U.S. Cl. 33—174 B **15 Claims**

Apparatus is described for aid in drawing computer flow charts. The apparatus includes a template band formed in a closed loop with cutouts the flow chart symbols. The upper portion of the template band is held flat against the surface of a drawing board, the remaining loop of the template band encircling the drawing board. A guide mechanism holds the

bracket square with the drawing board. The template band can be moved horizontally through the bracket and vertically



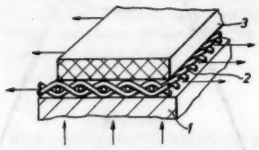
with the bracket to position cutouts at desired locations on the drawing surface.

3,665,613

METHOD OF AND APPARATUS FOR DRYING WET FILAMENT TOWS

Hans Alwin Erich Gieseke, deceased, late of Dormagen, Germany (by Ingrid Nora Hansine Gieseke, heir); Alfred Nogaj, Dormagen, Germany; Josef Schiefer, Cologne, Germany, and Heinrich Rinkler, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 13, 1970, Ser. No. 63,400
Claims priority, application Germany, Aug. 26, 1969, P 19 43 225.8
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **24 Claims**



Wet tows of filaments are dried on rotating drums at temperatures between 80° C. and 220° C. the surfaces of the drums having protuberances, for example in the form of wire fabric coverings, so that the vapors being formed between the two and the drum surface are able to escape through the interconnected cavities between the protuberances. Such drying of the tows imparts hardness to the handle of the fibers.

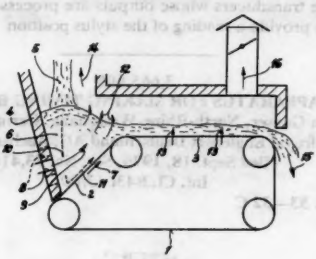
3,665,614

METHOD OF COOLING FRIED OR SINTERED MATERIAL

Horst Ritzman, Neubeckum; Otto Heinemann, and Wolf Goldmann, both of Ennigerloh, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Continuation-in-part of application Ser. No. 846,520, July 31, 1969,. This application Feb. 10, 1971, Ser. No. 114,323
Claims priority, application Germany, Aug. 9, 1968, P 17 58 803.3; May 23, 1969, P 19 26 436.9
Int. Cl. F27d *15/02*
U.S. Cl. 34—20 **4 Claims**

The fired or sintered material is discharged into a trough between an inclined traveling hearth and a fixed wall until the trough is substantially filled with the material. A gaseous cooling medium is conducted continuously through the fixed wall into the material in the trough, and material is carried on the traveling hearth in an upwardly inclined direction out of the trough and then horizontally away from the trough, the speed at which material is carried on the traveling hearth and the rate at which hot material is discharged into the trough being such that the depth of the horizontally traveling material on the traveling hearth is substantially less than the depth of the material in the trough.

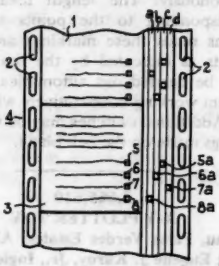


3,665,615

TEACHING MACHINE IN WHICH INSTRUCTION ITEMS ARE PROJECTED BY AN IMAGE PROJECTOR

Jacques Laplume, Gif-Sur-Yvette, France, assignor to Societe D'Etudes Techniques et D'Entreprises Generales (SODETEG), Le Plessis-Robinson, France

Filed Sept. 4, 1970, Ser. No. 69,739
Claims priority, application France, Sept. 9, 1969, 6930552
Int. Cl. G09b *7/08*
U.S. Cl. 35—9 A **14 Claims**

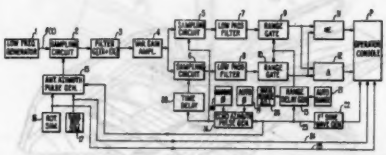


A strip film, carrying instruction items and questions with response indications thereon, and additionally, coded response code tracks (which are blocked from view of the student) is projected on a screen; the student is provided with a pointer having a photosensitive end, responding to the response items. A movable mask scans across both the response items and the response code track, and electrooptical transducers transmit the pulses upon scanning of a code position on this code track and the pulse from the photosensitive end to a logic circuit, which determines which code track has time-coincidence with the pulse from the photosensitive end. Subsequent indexing of the film to further instruction items (which may be entirely new instruction items or sub-items in further explanation in case the answer was wrong) is then controlled by the logic circuit decoding the coincidence of indication from a particular track and the photosensitive end.

3,665,616
SIMULATOR FOR MONOPULSE RADAR HAVING COHERENT DOPPLER FEATURES

Robert Basard, Meudon; Pierre E. C. Stoll, Chaville, and Pierre H. Sedes, Aristide Briand, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 10, 1969, Ser. No. 883,922
Int. Cl. G09b *9/00*
U.S. Cl. 35—10.4 **6 Claims**

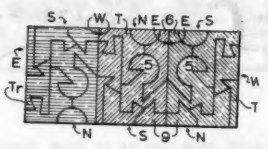


A device for simulating radar echo "video" signals as would be produced by a monopulse radar system having coherent pulse Doppler features. A low frequency signal is processed by multiple sampling, first by a pulse at the radar PRF which varies in time phase at the azimuth scan rate. Application of the resulting samples to a filter having an impulse response resembling the antenna beam pattern is followed by a controllable sampling to inject the dimensions of simulated echo angle and range. The result is realistic target signals which can be applied directly to a radar indicator for training of operators in the operation of monopulse tracking Doppler radar equipment.

3,665,617
DESIGN ELEMENTS FOR CREATING ARTISTIC COMPOSITIONS

Ina Gilbert, 265 Upper Highland Crescent, Willowdale, Toronto, Ontario, Canada

Filed Feb. 13, 1970, Ser. No. 11,054
Int. Cl. G09b *11/00*
U.S. Cl. 35—27 **11 Claims**



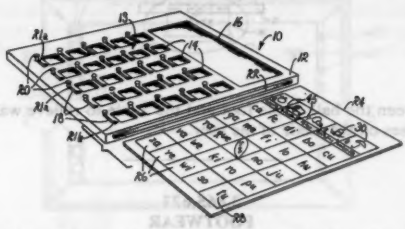
Tiles bearing identical designs comprised of separable components; the tiles being themselves assemblable in various combinations in which their designs merge to create a variety of continuous patterns; the design components of one tile being interchangeable with the corresponding components of the other tiles; some of the tile designs being reversals of others.

3,665,618
INSTRUCTIONAL GAME

Margaret K. Hahn, 3910 E. Belmont, Fresno, Calif.

Filed Aug. 17, 1970, Ser. No. 64,187
Int. Cl. G09b *17/00*
U.S. Cl. 35—35 H **19 Claims**

An instructional game for use by "beginning readers" in promoting early perception of letter patterns, particularly those including a vowel. The game is characterized by a plurality of master boards, each including thereon a compilation of words selected from a defined class of words, each word having a letter pattern common to the class and an established phonetic value, a multiplicity of similarly configured game boards, each being adapted to receive therein a replaceable game card, a plurality of replaceable game cards, each bearing a partial list of words selected from a given master board and displayed in parallel rows, and a plurality of word markers associated with each of the game boards.

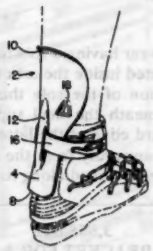


The game is played as words are chosen from a given master board, enunciated by a game director and simultaneously marked on game boards by a class of participants, through a digitation of the word markers, in order that a game winner be determined as the markers are by a winning participant grouped to conform to a predetermined pattern.

3,665,619
SKIER LEG SUPPORT

Brent E. Gray, Kent, Wash., assignor to Jet Stix, Inc., Enumclaw, Wash.

Filed Aug. 19, 1970, Ser. No. 65,179
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL **3 Claims**



A leg support specifically designed for application to the back of the lower portion of a skier's leg. The leg support is fabricated of a rigid substance and is designed to be secured by a strap. The leg support overlaps the upper portion of the back of the ski boot whereby the stiffness of the back of the ski boot is transferred upwardly onto the skier's calf, adding strength to the skier's leg during "availment." The term "availment" refers to the technique of leaning back on the skis for acceleration.

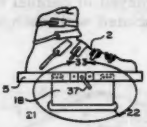
3,665,620
WALKING METHOD AND APPARATUS FOR SKI BOOTS

Maurice W. St. Clair, 1021 Sierra Dr., Menlo Park, Calif.

Filed July 1, 1970, Ser. No. 51,507
Int. Cl. A43b *3/10*
U.S. Cl. 36—7.5 **7 Claims**

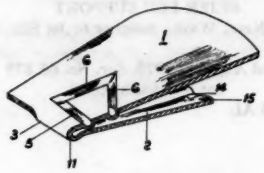
A walking method and apparatus for ski boots is disclosed wherein a walking member is detachably affixed to the sole of the ski boot. The walking member has a sole portion for engaging the walking surface and an upper portion for supporting and being affixed to the sole of the ski boot. The walking member depends from the sole of the ski boot and is shaped to provide a forward rocking motion for the ski boot during the user's normal stride. The point of engagement of

the sole of the walking member with the walking surface is generally confined to a region below the ski boot and



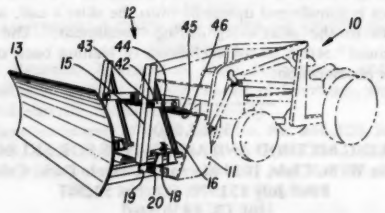
between the ball of the foot and the ankle to relieve walking stresses on the ankle of the user.

3,665,621
FOOTWEAR
Mario Massella, Germiston, South Africa, assignor to Ernest Colombo, Berario, Johannesburg, Transvaal Province, South Africa, a part interest
Filed July 6, 1970, Ser. No. 52,336
Claims priority, application South Africa, Feb. 23, 1970, 70/1162
Int. Cl. A43b *21/32*
U.S. Cl. 36—37 **4 Claims**



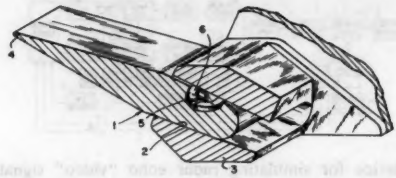
An article of footwear having a substantially inflexible heel supporting plate located inside the article and resiliently held above the heel portion of the sole thereof by a base plate which is located beneath the heel supporting plate and is secured to the forward edge of the latter the heel supporting plate being inclined upwardly from the forward edge thereof and the base plate being ribbed along its length.

3,665,622
CONVERTER BRACKET FOR A LIFT BUCKET
Ross H. Lamb, 1501 Colfox St., Benton Harbor, Mich.
Filed Mar. 16, 1970, Ser. No. 19,890
Int. Cl. E02f *3/62*
U.S. Cl. 37—117.5 **8 Claims**



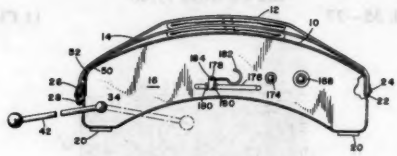
A converter bracket for a lift bucket carried by a mobile unit such as a tractor and enabling the attachment thereto of a working tool such as a scraper blade, fork lift, bush rake, snow plow, or the like, comprises a frame provided with a clamp means whereby said frame is removably affixed to the lower portion of the lift bucket. The frame is adapted to receive thereon the desired working tool.

3,665,623
TRENCHER TOOTH MOUNTING
Kenneth Murray White, Alberta, Canada, assignor to Western Rock Bit Company Limited, Calgary, Alberta, Canada
Filed Feb. 6, 1970, Ser. No. 9,274
Claims priority, application Canada, Mar. 21, 1969, 046,469
Int. Cl. E02f *9/28*
U.S. Cl. 37—142 A **17 Claims**



A trencher tooth is mounted by its shank in a pocket of a supporting member by means of a coiled spring arranged perpendicularly to the longitudinal direction of the tooth with its ends pressing against the tooth shank and the mounting pocket. The coiled spring preferably comprises a lockwasher received in a shallow recess in the tooth shank.

3,665,624
PORTABLE GARMENT PRESSING DEVICE
Charles D. Briddell, 335 Hill-N-Dale Dr., York, Pa.
Filed Aug. 21, 1970, Ser. No. 66,005
Int. Cl. A47j *51/00*
U.S. Cl. 38—71 **27 Claims**

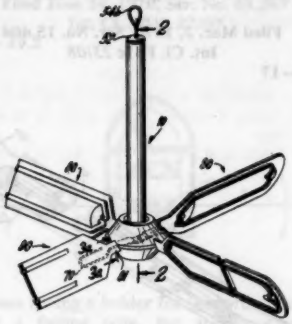


A portable garment pressing device comprising a base buck having a pressing surface against which the garment is placed for pressing and an elastic cover sheet adapted to extend over the garment and be stretched to conform to variations in thickness of the garment and hold the garment firmly against the buck while being pressed, either with or without the employment of heat. The device also may be used to store a garment in pressed condition by hanging the pressing device with the garment in it in depending manner in a storage space, such as a closet.

3,665,625
ROTATING ADVERTISING DISPLAY
Jerome A. Moss, 333 West End Ave., New York City, N.Y.
Filed Mar. 27, 1970, Ser. No. 23,345
Int. Cl. G09f *11/10*
U.S. Cl. 40—33 **16 Claims**

A slowly rotating knockdown advertising display simulates a fan and comprises removable and replaceable fan blade simulating members in form of advertising signs which can be read as the blades rotate. The device is powered by a battery

operated motor. The motor, in one form of the invention, is provided with an "on" and "off" switch. The display comprises components which can be easily shipped in knockdown condition and assembled upon delivery.

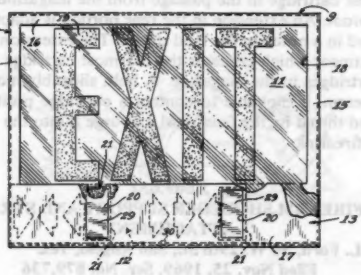


3,665,626

EXIT SIGN WITH ADJUSTABLE INDICIA

Alvin R. Lund, Carpentersville, and Jack Kaufman, Chicago, both of Ill., assignors to Markstone Manufacturing Company

Filed Mar. 3, 1970, Ser. No. 16,027
Int. Cl. G09f 13/06
U.S. Cl. 40—132 D 17 Claims



A visual indicator, such as an exit sign, having a display panel which is a closure for the front of a housing containing a light source. The panel includes means for providing both a first transmitting visual image such as the word "Exit," and an area for a second light transmitting visual image such as an arrow. A mask-like means is mounted on the panel for movement between a plurality of positions, and has a plurality of visually different images which can be selectively registered with the second image area providing different second images. The panel and mask-like means have releasable means, accessible only when the panel is at least partially removed from the housing, to fix the mask-like means in each of the plurality of positions.

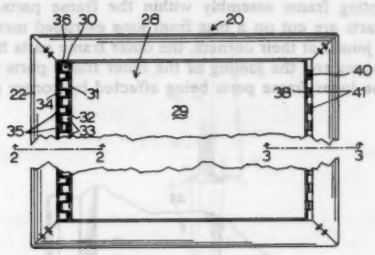
3,665,627

PICTURE FRAME

William Robert MacCluney, Route one Queen Ann Farm, Ashland City, Tenn.

Filed June 22, 1970, Ser. No. 48,080
Int. Cl. G09f 1/12
U.S. Cl. 40—152 4 Claims

A picture frame having an elongated abutment surface on at least one inner edge of the rear portion of the frame, and a backing member having an elongated elastic closure member along one edge opposing and yieldably and releasably engaging the abutment surface, for holding a picture in the frame.

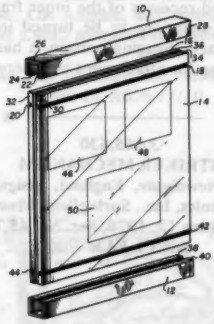


3,665,628

PICTURE HOLDER

Howard R. Dammond, 390 West End Ave., New York, N.Y.

Filed Mar. 2, 1970, Ser. No. 15,594
Int. Cl. G09f 1/12
U.S. Cl. 40—155 6 Claims



A picture holder comprising separate upper and lower clamping members and separate front and back picture retaining members. The front and back picture retaining members comprise means which cooperate with the clamping members to form the fully assembled picture frame. The upper and lower clamp members may be identical and the front and back picture retaining members may also be identical. In addition, spring means may be provided disposed within the upper and lower clamping members for providing additional picture retaining pressure to the front and back members.

3,665,629

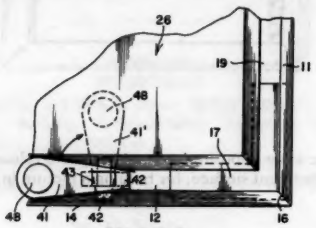
CLIP FASTENED PICTURE FRAME ASSEMBLY

Frank Shore, 26 Lantern Rd., Hicksville, N.Y.

Filed Nov. 20, 1970, Ser. No. 91,282
Int. Cl. G09f 1/12
U.S. Cl. 40—156 9 Claims

A picture frame assembly formed of outer and inner frame parts, the inner frame parts being slidably or snap fastened

into the space in the outer frame parts and being interchangeable with inner frame parts of different shape and construction for serving the purpose of securing a wooden painting frame within the frame parts and at the same time utilizing clips for the securing of the picture mat assembly for the painting frame assembly within the frame parts. The frame parts are cut on a bias from long extruded members and are joined at their corners, the outer frame parts having rear grooves and the joining of the outer frame parts to include the inner frame parts being effected by corner plates



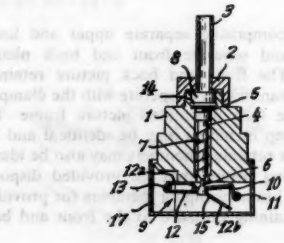
extending into the ends of the grooves at the corner joints thereof and the inner parts having square recesses for receiving the picture mount assembly or a painting and clips adapted to be turned fastened into the grooves on the back of the outer parts and turned to a location to overlie the back of the picture - mat assembly or painting frame to hold the same in the squared recesses of the inner frame parts. Clips having opposing projections to be turned into a T shaped slot, a picture surface engaging portion, a hanging wire loop portion and opening for attachment by a screw to a wooden frame.

3,665,630

STRIKER MECHANISM

Leonard Taylor, Newdigate, England, assignor to Smith & Wesson Pyrotechnics, Inc., Springfield, Mass.

Filed June 12, 1970, Ser. No. 45,703
Int. Cl. F42c *7/00*
U.S. Cl. 42—12 **3 Claims**



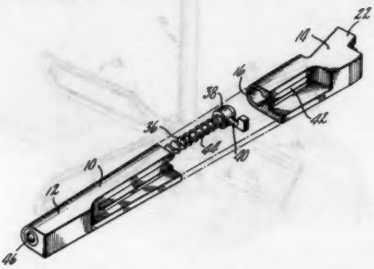
An improved striker mechanism for controlling contact of a firing pin with a percussion cap. In a first safe position the striker mechanism retains the firing pin in a safe condition out of contact with the percussion cap. In a second pin position the striker mechanism moves the firing pin to a cocked condition from which the pin is released for detonating the cap.

3,665,631

SELF CONTAINED MAGAZINE

Robert E. Domian, and Paul A. La Violette, both of Tolland New Haven, Conn., assignors to Colt's Inc., Hartford, Conn.

Filed Mar. 2, 1970, Ser. No. 15,404
Int. Cl. F41c *25/08*
U.S. Cl. 42—17 **7 Claims**



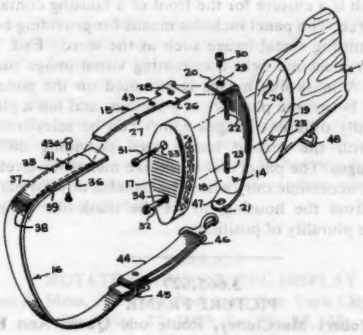
A magazine is mounted in a firearm which includes a feed throat. The magazine has an elongated housing made of a plastic material which includes front and rear portions and a continuous passage extending through the front portion into the rear portion. A magazine spring assembly having a follower is mounted within the housing to urge an aligned row of cartridges in the passage towards the rear portion. The rear portion includes two lower spaced walls which define a slot in communication with the passage for receiving a feed pawl attached to the feed throat. The rear portion further includes an opening communicating with the passage to permit loading of the magazine and feed pawl urged egress of the rearmost cartridge in the passage from the magazine into the feed throat. An extension in the rear portion is adapted to be received in a notch in the feed throat. The extension includes an abutment which contacts the rearmost cartridge to retain the cartridges in the magazine. A bolt, slideably mounted in the firearm, is movable to contact a cartridge positioned in the feed throat by the feed pawl and urge it into the chamber of the firearms.

3,665,632

FIREARM SHOULDER SUPPORT AND STRAP ATTACHMENT

Wade L. Ford, 30 W. 29th St., San Angelo, Tex.

Filed Nov. 25, 1969, Ser. No. 879,736
Int. Cl. F41c *23/00, 23/02*
U.S. Cl. 42—71 R **9 Claims**



An attachment for a firearm having a stock and a barrel, generally including a rigid support member secured to the stock and projecting rearwardly from the upper end of the stock, and a stray secured at one end thereof to the support member, and being attachable at the other end thereof to the underside of the stock.

3,665,633

FISHING APPARATUS

Leonard E. Scott, 824 Norfolk Ave., Westchester, Ill.

Filed June 24, 1970, Ser. No. 49,267
Int. Cl. A01k 87/00
U.S. Cl. 43—19.2 10 Claims

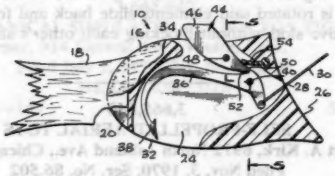
An apparatus having a holder for supporting and retaining one end of a fishing pole, the apparatus including a mechanism operative to drive the holder and impart thereto a particular cyclic swinging motion to the pole, the mechanism also producing at one part of the cycle a whipping action on the line at the free end of the pole.

3,665,634

FISH PLUG LURE

Roger C. Baud, Redwood City, Calif., assignor to Finizen Lures, Inc., Carson City, Nev.

Filed May 1, 1970, Ser. No. 33,697
Int. Cl. A01k 83/02
U.S. Cl. 43—35 13 Claims



Fish lure having a body within which is pivoted a hook which can move from a fully-retracted position to an extended position. The leader extending from the fish tackle to the lure is secured to the hook in such a position that the hook is stressed by leader tension toward the extended position. Trigger means, actuatable by the fish, retains the hook in the retracted position until actuated. A resilient member urges the trigger means into the hook retention position. The body of the fish lure resembles fish bait and the trigger means resembles a natural fin thereon.

3,665,635

COMBINED FISHHOOK KEEPER AND WINDING CHECK

Fredrick W. Lumbard, Los Angeles, Calif., assignor to Milton J. Stevens, Glendale, Calif.

Filed Oct. 12, 1970, Ser. No. 79,939
Int. Cl. A01k 87/00
U.S. Cl. 43—25.2 4 Claims

A stretchable, washer-like item for disposition on the inner end of the hand grip of a fishing rod and having the dual purpose of checking the winding usually applied to a fishing rod where the same extends from the grip and which serves to impart a finished appearance to the rod at that point, and as

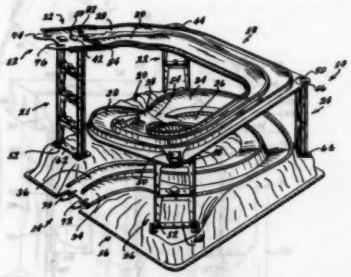
a keeper for the barbed fishhook on the end of the line of said rod.

3,665,636

HILL RACE TRACK

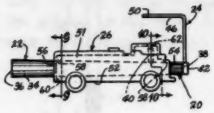
John T. Benson, Los Angeles, and Anthony D. Miller, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed July 31, 1969, Ser. No. 846,317
Int. Cl. A63h 11/10
U.S. Cl. 46—1 K 5 Claims



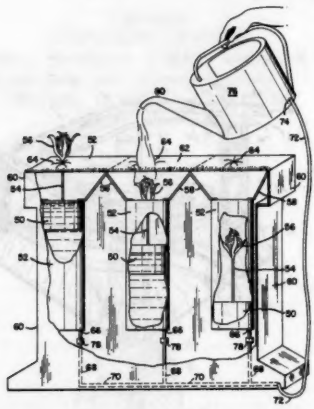
A roadway for toy vehicles which provides a tall, winding, mountain-like road with two parallel tracks, which can be stored in a box of limited height, comprising a rigid lower member forming lower portions of the tracks and a flexible upper member forming upper portions of the tracks. The upper member can be placed in a substantially flat configuration for storage, or can be placed in a largely helical configuration and supported on top of the lower member to form the upper portion of the roadway. A starting gate at the upper end of the roadway can be used to start a pair of vehicles, or can be swung out of the way to allow moving vehicles received from previous track regions to move into the mountain-like roadway without hindrance.

3,665,637
BUBBLE PIPE TOY
Irving Starr, 28 Bullitt Park Place, Columbus, Ohio
Filed Dec. 11, 1970, Ser. No. 97,092
Int. Cl. A63h *33/28*
U.S. Cl. 46—6 **11 Claims**



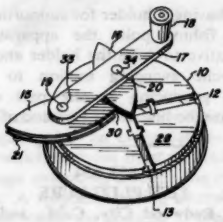
A bubble pipe toy for blowing bubbles. The bubble pipe is in the form of a tubular pipe having an upstanding chimney over which a ring element in the form of an L-shaped wand is fitted. The wand may be integrally formed on the pipe or in a preferred form has a square end receivable within a socket having a square opening to provide registry of the ring over the chimney. The pipe further receives toy figurines, such as in the shape of a locomotive or other toy, which is snapped or molded directly on the tubular pipe with the chimney fitting through the toy. The pipe is simply employed by dipping the ring element of the wand into a soapy solution and blowing through the pipe with air expelled through the chimney and forming bubbles from a soapy film over the ring element.

3,665,638
HYDRAULICALLY ACTUATED CHILDREN'S TOY
Elizabeth N. Weistrop, 505 Dolores Ave., Half Moon Bay, Calif.
Filed Jan. 27, 1971, Ser. No. 110,087
Int. Cl. A63h *29/08*
U.S. Cl. 46—41 **12 Claims**



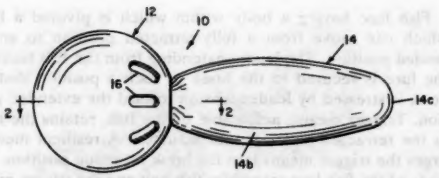
A hydraulically actuated children's toy to which the user adds a controlled amount of water or other fluid in order to produce a particular visual effect simulating a realistic phenomenon. The addition of fluid causes a float member to move a visual representation of a natural object between a concealed and a visible position. The float and the visual effect element are connected by conventional linkage appropriate to produce the required relative movement. The upward movement of the float in response to the rising level of supporting fluid causes the visual effect element either to appear from the interior of the toy or to disappear within it depending on the linkage. The fluid is contained within a closed hydraulic system wherein means are provided for returning the fluid to a portable container whereby the motion of the visual effect element is reversed. Specific embodiment disclosed are directed to devices simulating the growth of a plant from within a flower pot and the extinguishment of a fire within a building.

3,665,639
KINETIC AMUSEMENT DEVICE
William W. Knox, Concord, Ohio, assignor to Mag-Nif, Inc., Mentor, Ohio
Filed May 13, 1971, Ser. No. 142,698
Int. Cl. A63h *1/32*
U.S. Cl. 46—47 **3 Claims**



A self-contained kinetic amusement device having a circular base provided with a pair of slots which perpendicularly intersect at the center of the said circular base, a pair of horizontally and linearly slidable elements, and crank means connecting both of said elements, so that when said crank means is rotated said elements slide back and forth in their respective slots without blocking each other's sliding movement.

3,665,640
SELF-PROPELLED AERIAL TOYS
Norbert A. Kirk, 6912 North Ashland Ave., Chicago, Ill.
Filed Nov. 3, 1970, Ser. No. 86,502
Int. Cl. A63h *27/06*
U.S. Cl. 46—74 R **4 Claims**



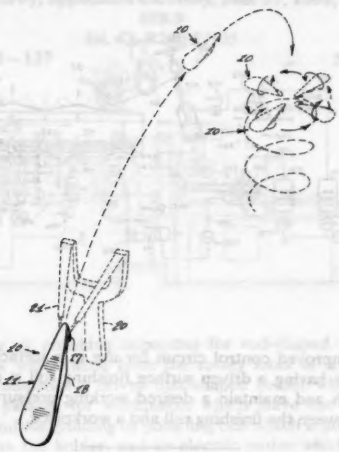
An elongated inflated baloon has its intermediate portion passing through and secured in an opening in the wall of a hollow body so that an inner end portion of the baloon is disposed inside the body and its outer end portion extends outwardly, while gas communication between the inner and outer portions is maintained through the intermediate portion of the inflated baloon. While the outer end portion is held by hand of a user, the baloon is introverted by finger pressure directed longitudinally inwardly against its outer end, thus increasing gas pressure inside the baloon and providing reaction force for its propulsion along with the body when the baloon is released.

3,665,641

SPIN DOWN

Clifford W. Henderson, 9804 Greenway Place, Shreveport, La.

Filed July 29, 1968, Ser. No. 748,484
Int. Cl. A63h 27/14
U.S. Cl. 46—81 2 Claims



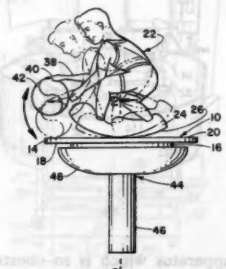
A toy comprising a airfoil launched from a sling shot type of launcher, the airfoil having a contour which will cause it to spin on its descent after having been projected into the air.

3,665,642

MECHANICAL SIMULATED ACTION TOY FIGURE

John I. Horner, 914 Electric Ave., Venice, Calif.

Filed July 2, 1970, Ser. No. 51,896
Int. Cl. A63h 13/18
U.S. Cl. 46—147 5 Claims



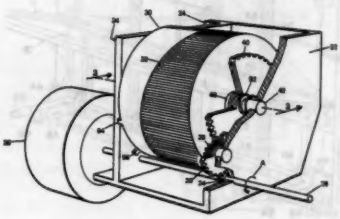
A base has an upper platform presenting a normally upwardly facing platform surface and a central rod-like handle projecting downwardly therefrom. A toy figure is horizontally pivotly mounted on said platform surface projecting upwardly therefrom and contacting said platform surface through upwardly and generally horizontally extending arcuate lower surfaces of shoes of said figure. A resilient fastener is secured between said platform and said figure generally centrally of said figure arcuate lower surface so that said figure will rock over said arcuate surface along said platform surface upon generally horizontal reversing movement of said platform through said handle. The resilient fastener between said platform and said figure may permit pivoting of said figure in multiple horizontal directions during said rocking and a ball secured to a hand of said figure may overly said platform surface and periodically contact said platform surface during said rocking.

3,665,643

TOY VEHICLE

Ronald B. Colgrove, 56679 Maple Hill Rd., South Wales, N.Y.

Filed Apr. 1, 1971, Ser. No. 130,342
Int. Cl. A63h 17/00
U.S. Cl. 46—206 14 Claims



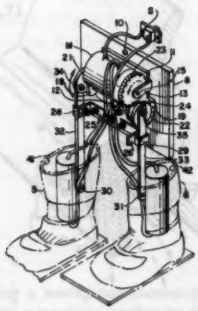
A toy vehicle having one or more ground contacting elements such as wheels, an indicating drum movable in one direction in response to wheel movement, stops for limiting the movement of the drum and locking the wheels to simulate an empty fuel condition, a simulated fuel pump insertable into an opening in the vehicle for moving the indicating drum in an opposite direction without any movement of the wheels to simulate a fully fueled condition, whereby further movement of the vehicle in the one direction is permitted.

3,665,644

RUNNING DOLL OR THE LIKE

Fredric Thomas Rapp, 331 Wilson St., Syracuse, N.Y.

Filed Sept. 2, 1970, Ser. No. 68,936
Int. Cl. A63h 33/26
U.S. Cl. 46—245 10 Claims



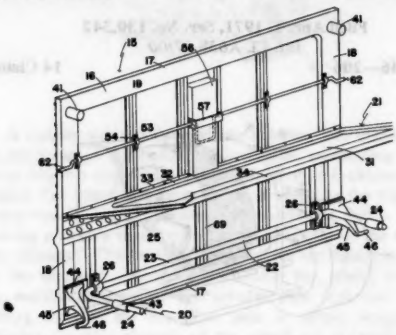
A running toy such as a doll or the like, including movable legs, motor means for moving said legs, and linkage means interconnecting said motor means and said legs for effecting movement of said legs in such a manner as to propel said doll or the like forwardly with a running motion. The legs of the doll or the like have feet thereon with an enlarged smooth bottom surface; and said motor, said linkage and said enlarged smooth bottom surface of said feet cause said doll or the like to run rapidly across the surface on which it is placed without the aid of external support means or the like.

3,665,645

DOOR ASSEMBLY FOR BAGGAGE COMPARTMENTS AND THE LIKE

Harry Zoltok, Winnipeg, Manitoba, Canada, assignor to Motor Coach Industries Limited, Winnipeg, Manitoba, Canada

Filed Jan. 4, 1971, Ser. No. 103,773
Int. Cl. E05d *15/00*
U.S. Cl. 49—248 19 Claims



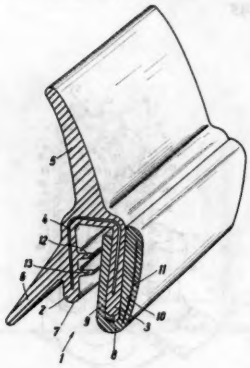
A planar door is held by a pantograph linkage and when it is closed, the lower catch engages and then the upper catch which pulls the door into a sealed relationship with the frame by an over center action.

3,665,646

SEALING STRIP

Gerd Niemanns, Viersen, Germany, assignor to Draftex GmbH, Viersen, Germany

Filed Mar. 9, 1970, Ser. No. 17,414
Claims priority, application Germany, July 29, 1969, P 19 39 169.6
Int. Cl. E06b *7/23*
U.S. Cl. 49—490 6 Claims



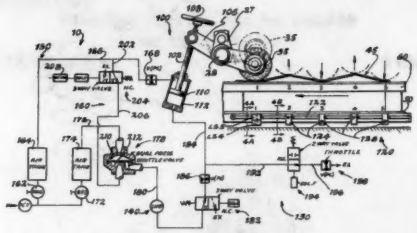
A U-shaped sealing strip adapted to be mounted on a support, especially for use in doors, trunk lids and the like of automobiles, comprising a firm sealing lip extending outwardly away from the apex portion of the U-shaped sealing strip, and a second sealing lip connected to and extending outwardly away from one leg of the U-shaped sealing strip in a direction away from the apex portion and extending beyond a plane which is perpendicular to the plane of symmetry of the U-shaped sealing strip and which passes through the edge of the end of one leg, the second sealing lip being adapted to sealingly rest against a member extending at an angle with respect to the support.

3,665,647

AUTOMATIC BUFF PRESSURE SETTING

James W. Weatherell, Olean, N.Y., assignor to Clair Mfg. Co., Inc., Olean, N.Y.

Filed Nov. 20, 1970, Ser. No. 91,398
Int. Cl. B24b *7/00, 1/00*
U.S. Cl. 51—45 5 Claims



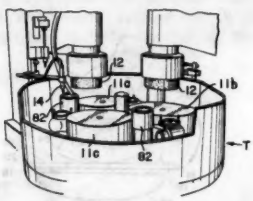
An improved control circuit for use in a surface finishing machine having a driven surface finishing roll is adapted to establish and maintain a desired working pressure relationship between the finishing roll and a workpiece.

3,665,648

GRINDING APPARATUS

Sadajiro Yamanaka, Chigasaki, Japan, assignor to Yugen Kaisha Yamanaka Seisakusho, Chigasaki-shi, Kanafawaken, Japan

Filed Sept. 28, 1970, Ser. No. 75,842
Claims priority, application Japan, Dec. 18, 1969, 44/101837
Int. Cl. B24b *17/00*
U.S. Cl. 51—134 7 Claims



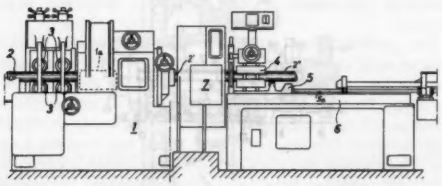
A grinding apparatus which is so constructed that three workholders are rotatably mounted on a turn table in equally spaced relation peripherally of said turn table to be intermittently shifted from one to another of three positions consisting of an inoperative position and a first and second working positions. Two grinding mechanisms are arranged exterior of said turn table adjacent said first and second working positions respectively. The table is operative in such a manner that a workpiece mounted on one of said workholders in said inoperative position is carried thereon to said first working position where it is roughly ground and then to said second working position where it is subjected to a finishing grinding and then back to said inoperative position to be removed from the apparatus, the intermittent rotation of said turn table being controlled by a detecting device which detects the amount of the workpiece ground by way of a master which is ground concurrently with said workpiece.

3,665,649

APPARATUS FOR GRINDING OF ROD-SHAPED WORKPIECES

Friedhelm Krejan; Ferdinand Beese, both of Mulheim-Ruhr; Hans Hufner, Essen-West; Franz Riedel, Solingen, and Rainer Holzmann, Dinslaken, all of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed July 30, 1969, Ser. No. 846,201
Claims priority, application Germany, June 29, 1968, P 17 52 659.9
Int. Cl. B24b *21/00*
U.S. Cl. 51—137 3 Claims



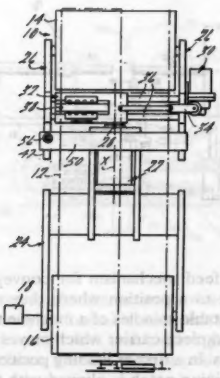
Grinding or polishing apparatus for rod-shaped metallic workpieces which issue from the rotary head of a shaving machine comprises a driven disk-shaped holder whose hub defines a passage for workpieces which leave the shaving head, an endless grinding or polishing belt which is adjustably mounted on the holder, and an electric motor which drives the belt and is mounted directly on the holder. The tensioning pulley for the belt is adjustable to enable the apparatus to treat workpieces of different diameters as well as to move the belt away from the path of cylindrical leading ends of successive workpieces.

3,665,650

ABRASIVE BELT CONTROL APPARATUS AND METHOD

Witold C. Przygocki, Southfield, Mich., assignor to Murray-Way Corporation, Birmingham, Mich.

Filed Oct. 22, 1969, Ser. No. 868,397
Int. Cl. B24b *21/00*
U.S. Cl. 51—135 BT 15 Claims



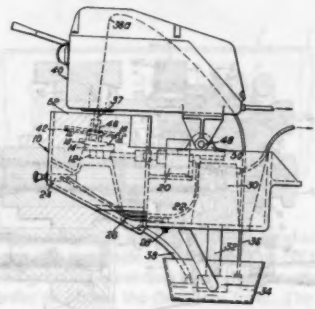
Apparatus and method for use with an endless abrasive belt operable to sense the position of the belt and to automatically oscillate the belt transversely in accordance with movement of a position sensor.

3,665,651

DEVICE FOR IMPARTING MOTION TO AN OPTICAL LENS

Stephen Jack Wylde, Croydon, England, assignor to J. L. S. Limited, Croydon, England

Filed Jan. 12, 1971, Ser. No. 105,813
Int. Cl. B24b *13/02*
U.S. Cl. 51—160 11 Claims



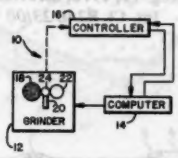
A device for imparting motion to an optical lens while the latter is held in contact with the working surface of a lens-grinding, smoothing or polishing tool, comprising a lens-holder mounted on a shaft which, at spaced-apart points along its length, passes through or is connected to at least two driven eccentric bearing assemblies of which one is of adjustable eccentricity and the other has two eccentrics driven at two speeds which are in selected ratios to each other so that the shaft is given a substantially uniform but substantially non-repeating motion by the said eccentric bearing assemblies.

3,665,652

GRINDING SYSTEM

Bernard M. Gordon, Magnolia; Leopold Neumann, Lexington, and Ivan H. Kirsch, Hyde Park, all of Mass., assignors to Gordon Engineering Company, Wakefield, Mass.

Filed Oct. 21, 1970, Ser. No. 82,631
Int. Cl. B24b *49/70*
U.S. Cl. 51—165.71 13 Claims



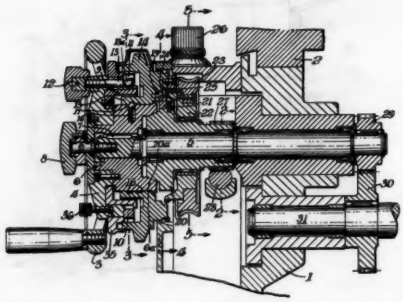
A grinder having a workpiece mounted thereon is operatively connected to a tracking analog to digital converter via a sensor unit. The analog to digital converter comprises a summing amplifier, a forward/backward counter, a gating control, and a digital to analog converter and defines a closed loop configuration. Signals at the output of the summing amplifier are applied to a peak detector which generates a signal representing the degree of out of round of the workpiece. Counting pulses generated by the counter are applied to a reset-delay via the gating control for generation of a signal indicating the rate of removal of material from the workpiece. Pulses representing the state of the counter are applied to a limit circuit which generates signals representing the amount of material removed from the workpiece.

3,665,653

FEED MECHANISM FOR MACHINE TOOL

Akiyoshi Kobayashi, Asahimachi, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Asahimachi, Kariya, Aichi Prefecture, Japan

Filed Jan. 19, 1971, Ser. No. 107,639
Claims priority, application Japan, Jan. 22, 1970, 45/6734
Int. Cl. B24b *49/00*
U.S. Cl. 51—165.81 7 Claims



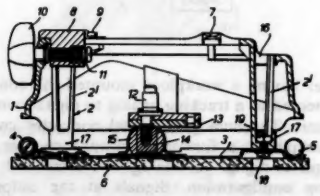
In the feed handle mechanism of a machine tool a handle is integrally fitted to a handle shaft. An operating member is rotatably and axially movably attached to the handle shaft. Clamping structure selectively secures the handle solidly to the operating member. A worm wheel is rotatably supported by the handle shaft, and a worm engaging the worm wheel is equipped at one end with an operator knob. Connecting structure connects the operating member to the worm wheel for fine feeding when the operating member is axially shifted in one direction. Dead stop structure is brought into play by shifting the operating member in the other axial direction to thereby control the rotation of the operating member. Switching between dead stop machining and fine feed machining is effected by axial shifting of the operating member.

3,665,654

HOUSINGS FOR POWER-DRIVEN ABRASIVE TOOLS

John Henry Flack, Ruislip, England, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 12, 1970, Ser. No. 63,216
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 MT 6 Claims



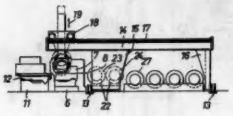
A housing adapted for rigid attachment to a portable tool having a rotary output shaft. A plurality of flexible posts are formed integral with the housing and have an abrasive backing plate attached thereto. Eccentric means on the backing plate is attachable to the output shaft and transmits motion to the backing plate.

3,665,655

DEVICE FOR AN AUTOMATIC EXCHANGE OF ROLLERS IN ROLLER POLISHING MACHINES AND THE LIKE

Ernst G. Klein, Siegen, and Artur Klein, Netphen, both of Germany, assignors to H. A. Waldrich GmbH, Siegen, Germany

Filed Apr. 24, 1970, Ser. No. 31,682
Claims priority, application Germany, Apr. 24, 1969, P 19 20 804.9
Int. Cl. B24b *47/20, 5/10*
U.S. Cl. 51—215 CP 7 Claims



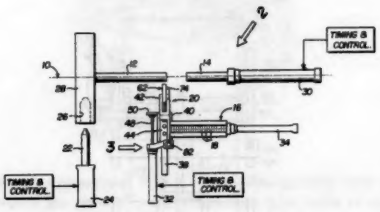
A device for the automatic exchange of rollers in roller polishing machines and the like is characterized by a movable frame located preferably outside of the plane of the machines and having a gripping device movable upon a fixed track for gripping and raising rollers from a stack, inserting a roller in the holders of a roller polishing machine and also for carrying out a reverse procedure. There is also provided a guide and/or an arresting device for making the gripping device axially parallel to the polishing machine, particularly as far as holders or drivers for roller pins at the mandrel stock are concerned.

3,665,656

WORKPIECE FEED MECHANISM

Edward M. Newsome, 25700 D'Hondt Court, Anchorville, Mich.

Filed Dec. 24, 1970, Ser. No. 101,353
Int. Cl. B24b *47/02*
U.S. Cl. 51—215 H 9 Claims



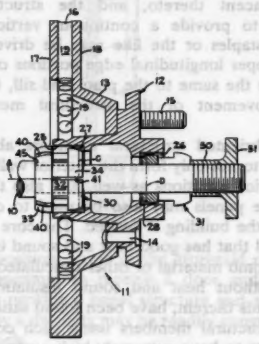
An automatic feed mechanism for conveying workpieces from a magazine to a position where they can be clamped between two rotatable spindles of a machine tool comprises a reciprocating workpiece carrier which moves radially relative to the spindle axis. In a first or loading position of the carrier, a workpiece retaining notch is aligned with the magazine to pick up a workpiece, and the carrier is movable forwardly toward a clamping position where the workpiece is placed into position between the temporarily axially separated spindles to be clamped therebetween. Means are also provided to assure that the workpiece and the machine tool are in a predetermined angular registry at the time of clamping.

3,665,657

APPARATUS FOR MOUNTING DISC BRAKE ROTORS DURING TRUING

Melvin H. Lill, Okemos, Mich., assignor to FMC Corporation, San Jose, Calif.

Filed July 22, 1970, Ser. No. 57,260
Int. Cl. B24b *41/06*
U.S. Cl. 51—236 4 Claims



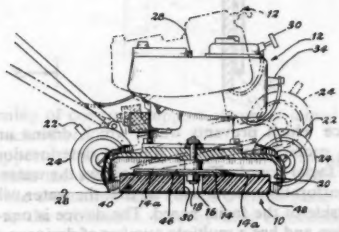
The mounting of a wheel hub on an arbor during truing of the disc brake rotor faces of the hub is accomplished with the aid of two special adapters. Each adapter has two contractible beveled crowned heads of different diameter to accommodate different size rotors. During truing, each end of the wheel hub is supported by the engagement of one crowned head of the adapter with the bearing cup in that end of the rotor. The adapters, which are contractible, are pressed into engagement with the arbor to take up all clearance between the arbor and the wheel hub.

3,665,658

DEVICE AND METHOD FOR SHARPENING ROTARY MOWER BLADES

David W. Warwick, 3640 Upper Mountain Rd., Sanborn, N.Y.

Filed Dec. 9, 1970, Ser. No. 96,565
Int. Cl. B24b *19/00*
U.S. Cl. 51—250 9 Claims



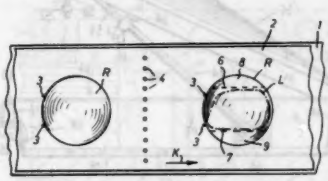
A rotary mower blade sharpener device formed substantially of a resiliently deformable material and characterized as having abrasive properties and friction gripping properties on opposing surfaces thereof. The opposing surface having friction gripping properties is adapted, when laid upon the ground or other expansive surface, to retard rotation of the device when the blade to be sharpened is subject to momentary rotations in surface engagement with the opposing surface having abrasive properties. The relative rotation of the blade with respect to the surface of the device having abrasive properties effects sharpening of the blade.

3,665,659

METHOD FOR THE PRODUCTION OF THE CIRCUMFERENCE OF A SPECTACLE LENS

Fritz Kotting, Sturzelberg, and Gotteried Gas, Monheim, both of Germany, assignors to Firma Wernicke & Co., Dusseldorf-Eller, Jagerstr., Germany

Filed Oct. 1, 1969, Ser. No. 862,868
Int. Cl. B24b *1/02*
U.S. Cl. 51—323 4 Claims



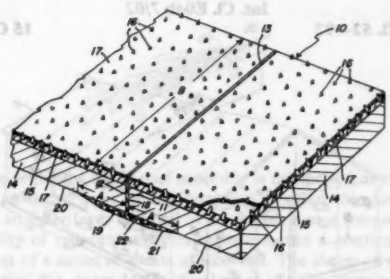
The invention relates to a method for the production of the circumference of a spectacle lens with cutting off the edge of the blank and grinding according to a template or a glass lens mount in order to obtain the final lens form. The subject of the invention is also an apparatus for carrying out this method.

3,665,660

COATED ABRASIVE BELT JOINT

John F. Malloy, Waterford; Nolan A. Curry, Troy, and Dirck J. Olton, Loudonville, all of N.Y., assignors to Norton Company, Troy, N.Y.

Continuation-in-part of application Ser. No. 823,105, May 8, 1969, now abandoned. This application Jan. 6, 1971, Ser. No. 104,309
Int. Cl. B24d *11/06*
U.S. Cl. 51—399 16 Claims



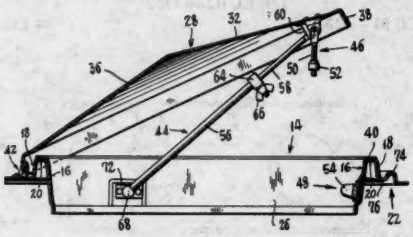
A coated abrasive material having a butt joint therein in which the abutted ends of the abrasive material are joined together by an initially thermoplastic, heat-hardened adhesive applied to the backside of the coated abrasive material adjacent the line of abutment and the adhesive layer is reinforced with a woven patch of a particular aromatic polyamide fiber which is placed on the backside so as to cross the abutment line. Adhesive fills the crack between the abutted coated abrasive ends and, moreover, forms a tapered surface from the backside of the coated abrasive material up to the outside surface of the reinforcing patch and preferably coats the exterior surface thereof.

3,665,661

ATTACHABLE PREFABRICATED HATCH

Frank S. Beckerer, 134 Far Horizon Dr., Easton, Conn.

Filed Nov. 10, 1969, Ser. No. 875,206
Int. Cl. E02d 29/12; E04b 7/18; E04f 19/08
U.S. Cl. 52—19 3 Claims



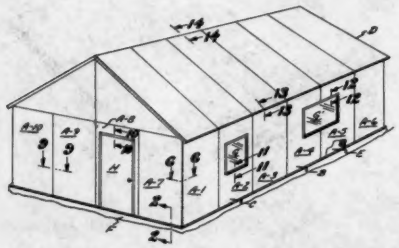
A prefabricated hatch construction for attachment over an opening in a wall or the like, comprising a rectangular reinforced plastic frame and a reinforced plastic cover hinged thereto. The frame is of channel-like cross section, including a depending inner skirt to extend through the wall opening and an outwardly extending peripheral flange to overlie and be secured to those portions of the wall which border the opening thereof. The flange has a reversely curved section providing for wind and rain deflection, and also constituting a springy-bearing for a sealing gasket which is engageable with the wall. The cover is crowned and has a depending peripheral flange which wedgingly engages the channel section of the frame to effect a tight seal. Adjustable telescopic struts provide for holding the cover in various open positions on the frame, and cooperable fastener devices lock the cover in its closed position.

3,665,662

STRUCTURAL MEMBER AND BUILDING EMBODYING SAME

Robert L. Timbrook, 9680 Corbin Ave., Northridge, Calif., and A. Lynn Castle, Box 914, Zephyr Core, Nev.

Filed July 20, 1970, Ser. No. 56,363
Int. Cl. E04b 7/02
U.S. Cl. 52—92 15 Claims



A substantially rectangular prefabricated structural member that includes a core of rigid material that has two transversely aligned rectangular panels secured to opposite longitudinally extending surfaces thereof. The structural members when disposed side by side and situated between a foundation supported sill and an elongate plate situated vertically thereabove, cooperate to define a wall structure.

The panels are of greater height and width than the core with which they are associated, and cooperate with the core to define first and second horizontal channels that interlock with the sill and plate to hold the structural member in a fixed transverse position relative thereto. The panels on each structural member project outwardly from a first vertically extending side surface of the core to cooperate with said first side surface to define a third vertically extending channel.

A first vertically extending section of the core extends outwardly from the first and second panels, with this outwardly extending section having a second vertical side surface defined thereon. When the structural members are interlocked with a sill and plate and disposed side by side, the vertically extending section of one structural member is disposed within the third channel of the structural member situated adjacent thereto, and the structural members cooperating to provide a continuous vertically extending wall. Nails, staples or the like may be driven through the lower and upper longitudinal edge portions of the panels to firmly secure the same to the plate and sill, to prevent longitudinal movement of the structural members relative thereto.

The prefabricated structural members above described may be used to not only form the exterior walls of a building, but the interior partitions as well, and also the floor of the building. The panels may also be used to define the roof structure of the building if desired. The core is preferably a rigid material that has good heat and sound insulating qualities. Honeycomb material or other reticulated material, both with and without heat and sound insulating composition filling the voids therein, have been found satisfactory for use as cores. Structural members using such cores have been found by tests to have extremely high compression resistant qualities as well as being capable of withstanding exceptional high wind loading.

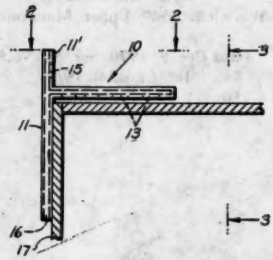
The exterior longitudinally extending surfaces of the structural members above described preferably have means included as an integral part thereof that permit stucco or other cementitious material to bond thereto when applied by conventional methods, and without the use of wire screen, mesh or the like.

3,665,663

DRAINING TYPE GRAVEL GUARD

Frederick W. Scherer, 323 Arabella St., New Orleans, La.

Filed July 24, 1970, Ser. No. 57,936
Int. Cl. E04b 7/00
U.S. Cl. 52—95 1 Claim



A device which prevents water which drains under the gravel on roofs from causing rot and deterioration to the eaves and facial boards. This device allows the water to drain through perforations in its body so that the water will escape to the outside of the facial board. The device is one-piece in construction and has a multiple number of drainage openings for the water to seep into and out of the device, in order that a roof will be dry.

3,665,664

BUILDING PANEL AND STRUCTURE CONSTRUCTED THEREWITH

Cecil C. Watson, 1610 W. 42nd St., Richmond, Va.

Filed Mar. 20, 1970, Ser. No. 21,388
Int. Cl. E06b 1/04
U.S. Cl. 52—211 4 Claims

A building panel comprising spaced-apart inner and outer facing members having a foamed plastic material therebetween. The building panel including load-bearing sur-

faces along the top, bottom and side edges thereof, the load-bearing surfaces at the side edges of the panel adapted to engage with load-bearing surfaces on the next adjacent panel and to be secured thereto for retaining the panels in their

proper erected position. Some of the aforesaid panels being provided with openings to receive a door and/or window structure to thus provide a panel structure and arrangement of panels whereby a dwelling may be readily constructed with the aforesaid panels.

3,665,665

ASSEMBLY OF CONCRETE SUPPORT ELEMENTS

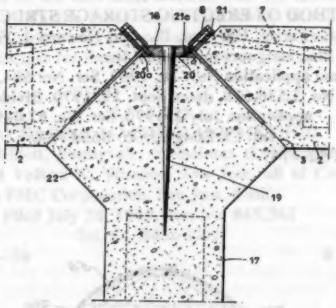
Rene Soum, Toulouse, France, assignor to Entreprise Guiraudie et Auffeve, Toulouse, France

Filed July 30, 1970, Ser. No. 59,450

Claims priority, application France, Feb. 9, 1970, 7006418

Int. Cl. E04b *1/00*

U.S. Cl. 52—251 **8 Claims**



As assembly of concrete support elements joined at right angles to each other.

Each support element has a beveled end forming a joint plane between the two elements. Each bevel point is truncated and the truncation face by bass embedded in the mass of the support element. The two plates are tightened towards each other on their edge by tightening means incorporated therein.

3,665,666

DEVICES FOR INTERCONNECTING PLATES

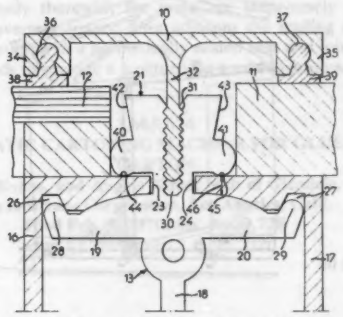
Andre Delcroix, 5, rue Pasteur, 59-Wattrelos, France

Filed Dec. 3, 1970, Ser. No. 94,930

Int. Cl. E04b *2/30, 2/60*

U.S. Cl. 52—461 **8 Claims**

A device for interconnecting two adjacent spaced plates forming at least part of a wall, comprises a cover plate arranged on one side of the plates, a plurality of monobloc connectors arranged on the opposite side of the plates and a pair of channel members for each connector. The connectors are each in the form of a central member provided at each end with transverse flanges extending from opposite sides of the central member. The connectors each have a projection extending beyond the flanges into the space between the plates, the flanges and the projection defining between them a pair



of opposed grooves. Each groove receives a limb of a channel member. Each projection is formed with a slot which divides the projection into two parts and receives and holds a complementary shaped rib on the cover plate. The minimum width of each groove is less than the thickness of its respective limb so that when the limbs are arranged in the grooves, the two parts of the projection are urged towards each other to grip the rib.

3,665,667

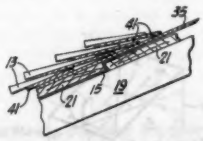
FIRE-RETARDANT WOOD ROOF ASSEMBLY

William J. Oberley, Monroeville, and John E. Daly, Pittsburgh, both of Pa., assignors to Koppers Company, Inc.

Continuation-in-part of application Ser. No. 741,625, July 1, 1968, now Patent No. 3,538,666. This application May 21, 1970, Ser. No. 39,489

Int. Cl. E04d *1/26, 1/36, 1/28*

U.S. Cl. 52—556 **7 Claims**



A fire-retardant wood roof assembly is comprised of three layers; an outer layer of fire-retardant wooden shingles or shakes, an inner layer of wood or a subdeck that is formed of a plurality of adjacent wooden members, and a continuous interlayer of a series of sheets of steel foil. The sheets of steel foil nearest the upper longitudinal edge of each member of the inner layer extend over a portion of the top surface thereof, bend downwardly to conform to the upper longitudinal edge of each member, fill the space between each member and each next upper adjacent member, bend towards each next upper adjacent member to conform to the lower longitudinal edge of each next upper adjacent member and cover a portion of the bottom surface of each next upper adjacent member.

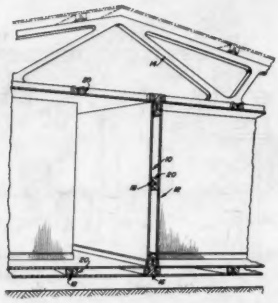
The series of sheets of steel foil protect the inner layer of wood from exposure to the flame and air, dissipate heat from the top surface of such members should the outer layer of fire-retardant shingles or shakes become exposed to flame, and seal the space between the adjacent wooden members. Consequently, ignition of the top surface of the inner layer of wood from a flame above the wood roof assembly is prevented.

3,665,668

CONSTRUCTION JOINT FOR BUILDINGS AND THE LIKE

Orville Lee Maddan, Jr., P.O. Box 141, Mary Esther, Fla.

Filed Mar. 3, 1970, Ser. No. 15,977
Int. Cl. E04c 1/10; E04b 2/32
U.S. Cl. 52—275 8 Claims



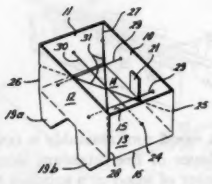
A construction joint in the nature of interengaging elongated male and female connectors utilized in interlooking all of the components of a prefabricated building including the structural members and partition units. The male component basically includes a wide base with a narrow rib projecting centrally therefrom along the length thereof. The female connector has a recess defined therein configured so as to closely receive both the rib and base of the male connector. Basic variations are provided for joining adjacent panels and interlocking with similarly configured enlarged male connector beams.

3,665,669

FOLDABLE CONSTRUCTION BLOCK

William C. Huber, Seabrook, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 18, 1970, Ser. No. 73,422
Int. Cl. E04c 1/10
U.S. Cl. 52—594 3 Claims



Apparatus and method of construction using foldable building blocks. A first embodiment of the apparatus includes an open top construction block foldable from a flat sheet of material to form a container having downwardly extending interlock tabs, with struts being provided between opposite vertical walls and diagonally opposed vertical joints to control horizontal expansion of the block when a solid material is placed therein. A second embodiment of the apparatus includes a closed top block foldable from a single sheet of material with interlock tabs extending downwardly from one side wall of the block and interlock tab receiving slots provided in the top of the block.

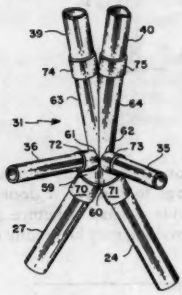
The method includes folding box-shaped containers with downwardly extending interlock tabs from flat sheets of material, filling the containers with available solid material and stacking the containers in courses in overlapping relationship so that the interlock tabs extend downwardly into similar containers in the underlying course.

3,665,670

LOW-MASS TRUSS STRUCTURE

Donald R. Rummler, Hampton, Va., assignor to The United States of America as represented by the Administration of the National Aeronautics and Space Administration

Filed Apr. 28, 1970, Ser. No. 32,664
Int. Cl. E04h 12/06, 12/10
U.S. Cl. 52—648 1 Claim



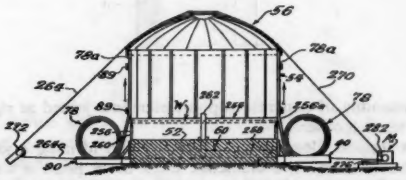
A low-mass truss structure wherein a plurality of angular disposed elongated thin-walled tubular segments are connected to a plurality of joint clusters formed of short tubular members to form a unitary truss structure.

3,665,671

METHOD OF ERECTING STORAGE STRUCTURES

Robert G. Ferris, Harvard, Ill., and Howard J. Ferris, Gulfport, Fla., assignors to Starline, Inc.

Original application Nov. 20, 1967, Ser. No. 684,366, now Patent No. 3,536,628, dated Sept. 29, 1970. Divided and this application July 2, 1970, Ser. No. 52,049
Int. Cl. E04g 23/06; B65d 7/00
U.S. Cl. 52—747 12 Claims



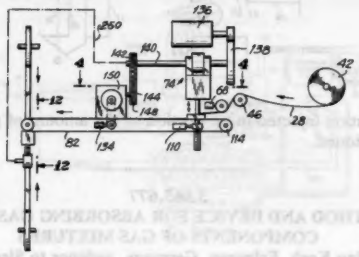
A method of erecting a permanent silo structure including the steps of assembling a plurality of transversely precurved, coiled wall members around the perimeter of a base, with the free ends of the wall members extending vertically upwardly and terminating in a common horizontal plane; inserting filler members between each of the wall members to create a sealed structure; assembling a roof to the free ends of the wall members; incrementally applying an upward force to unroll the coiled wall members to elevate the structure; and securing compressive members in vertically spaced positions around the perimeter of the wall members and filler members after each increment of upward force is applied.

3,665,672

METHOD AND APPARATUS FOR MANUFACTURING AND PACKING LANCETS

Irving A. Speelman, Roslyn Heights, N.Y., assignor to Propper Manufacturing Co., Inc.

Filed Jan. 5, 1970, Ser. No. 659
Int. Cl. B26d 5/22; B65b 63/00
U.S. Cl. 53—23 13 Claims



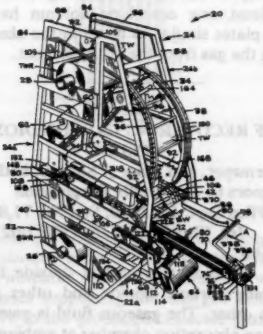
A method and apparatus for successively punching lancets from a strip of lancets and then packaging the lancets. In a precisely timed manner the strip is fed by an intermittent feed to a punch press where each of the successive lancets is precisely positioned to be punched from the strip. The punched lancets are successively received on a timing transfer belt which is intermittently driven in synchronism with the strip from which the lancets are punched. From the timing transfer belt the lancets are successively dropped onto a strip of adhesive paper which is to form part of a packaging for the lancets and which moves transversely with respect to the timing belt. A second strip of packaging paper is adhesively joined to the first strip to form with the latter sealed pockets in which the lancets are respectively situated, and these paper strips are cut between the pockets to form separate packages for the separate lancets.

3,665,673

PACKAGING MACHINE AND METHOD

Ronald J. Billett, Sunnyvale; Wilhelmus H. Holtkamp, Milpitas, and Veikko K. Viltanen, San Jose, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed July 28, 1969, Ser. No. 845,361
Int. Cl. B65b 9/02
U.S. Cl. 53—30 8 Claims



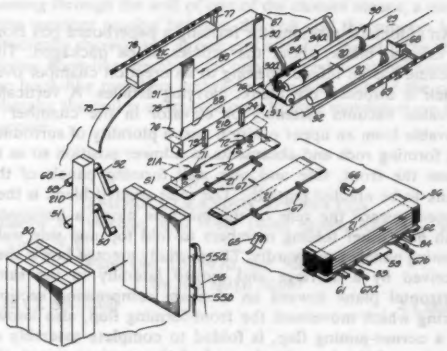
Food products supported on trays, of the clear or opaque variety, are fed, either manually or automatically, between plastic webs which constitute an overwrap for the tray and a product carried thereby. The plastic webs follow paths which intersect and they are joined along a transverse line by heated sealing and cutting mechanisms. Tray supported products, for convenience called units, are fed toward and past the juncture of the webs, while the webs are unwound from their respective parent rolls, enveloping the unit to be packaged therebetween. Thereafter the longitudinal edges of the webs adjacent the unit are heat sealed and cut while simultaneously therewith the webs are transversely joined along transversely spaced lines adjacent the trailing end of the unit resulting in a hermetically sealed unit and joining of the web ends to provide a juncture for a subsequent package.

3,665,674

AUTOMATIC CARTONING MACHINE FOR GLUE END CARTON

Elbert L. Bivans, and August Kund, both of Glendale, Calif., assignors to Bivans Corporation, Los Angeles, Calif.

Filed Feb. 9, 1970, Ser. No. 9,738
Int. Cl. B65b 57/12, 5/06, 7/20
U.S. Cl. 53—74 20 Claims



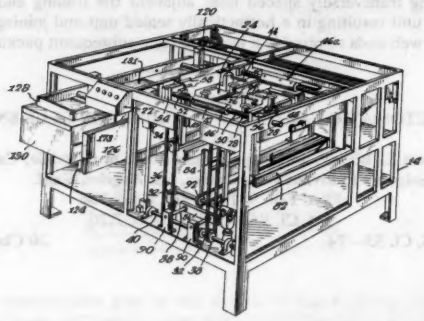
Automatic cartoning machine for glue end carton including twin cartoning units mounted in a common framework conveying side-by-side two stacks of cups or other articles, one stack for each unit. The units are similar, having their loading stations adjacent each other to receive the articles fed to them by the conveyer. Each unit has a plurality of cams making one complete revolution for one cycle of operation. Each cycle includes removing a collapsed carton from the bottom of a magazine, transferring it to a combined loading and squaring-up station where the stack of cups is loaded into the carton. The cycle is started by arrival of a stack of cups at a station which transfers the stack to a loading tray which holds the flaps open at the adjacent or outer end of the carton for easy insertion of the stack by a plunger. The cycle is terminated by one complete revolution of the cams. The minor flaps pass through a glue applicator on the way to that station. After the flaps are partially sealed at both ends of the carton, the carton is elevated to travel through a compression chute which completes the sealing of the flaps. The carton is then ejected in upright position to an accumulator. The accumulator operates in timed relation with the transfer of the cup stack from the conveyer to the loading tray, to prepare one cycle for starting at the successful completion of the preceding cycle.

3,665,675

PACKAGING MACHINE

Richard H. Johnson, Arlington Heights, Ill., assignor to Stone Container Corporation, Chicago, Ill.

Filed Feb. 11, 1970, Ser. No. 10,584
Int. Cl. B65b 11/18
U.S. Cl. 53—223 6 Claims



An automatic machine for forming a paperboard box from an integral blank, about the articles to be packaged. The machine has an infeed opening to an erection chamber over which is disposed the blank, carrying articles. A vertically movable vacuum assembly or elevator in the chamber is movable from an upper position past a plurality of surrounding forming rods and abutments to a lower position so as to cause the front, side and rear wall forming panels of the blank to be erected partially. The semi-erected blank is then moved toward the rear of the machine along a horizontal path past other folding members to fold top and side wall-forming panels downwardly. The partially erected box is then received by a carriage and moved laterally in the same horizontal plane toward an elongate compression section, during which movement the front-forming flap, also known as a corner-joining flap, is folded to complete assembly or erection of the box. At the end of the carriage travel, the completed box is pushed forwardly into the compression section for ejection through a discharge chute at the front end of the machine. Several completed packages are accumulated in the compression section and when the machine is operating one box is discharged or ejected from the chute as a completed box is pushed forward from the lateral carriage path. The rearward, lateral and forward movements of the partially and completely erected box are along a U-shaped path lying in a single horizontal plane. The discharge chute is provided with inwardly pressing side plates to firmly hold the side flaps against the side panels during the setting of the glue.

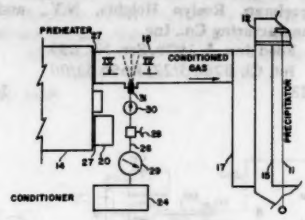
3,665,676

METHOD OF AND APPARATUS FOR CHEMICALLY CONDITIONING A PARTICLE-LADEN GAS STREAM

John L. McKewen, Cockeysville, Md., assignor to Koppers Company, Inc.

Filed Nov. 12, 1970, Ser. No. 88,581
Int. Cl. B03c 3/01
U.S. Cl. 55—4 11 Claims

A method of and apparatus for chemically conditioning a particle-laden gas stream to improve the collection characteristics of the entrained particles comprising the injection of a conditioner solution, preferably ammonium sulfate [$(NH_4)_2SO_4$], into the gas stream before the stream enters an electrostatic precipitator. The apparatus for injecting the solution includes an injection nozzle, inserted in a gas duct going to the precipitator, connected to a supply of the solution with a power supply and metering means for controlling the amount



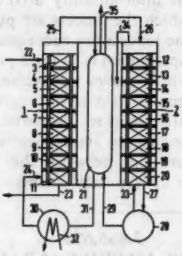
of solution injected in proportion to the amount of gas being conditioned.

3,665,677

METHOD AND DEVICE FOR ABSORBING GASES OR COMPONENTS OF GAS MIXTURES

Christian Koch, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 12, 1969, Ser. No. 875,954
Claims priority, application Germany, Nov. 13, 1968, P 18 08 623.2; Mar. 29, 1969, P 19 16 312.7
Int. Cl. B01d 19/00
U.S. Cl. 55—56 22 Claims



Method of absorbing gases or components of gas mixtures includes introducing from below the gas and a liquid solvent for absorbing the gas into at least one absorbing column having a plurality of vertically spaced filter plates formed of highly porous sintered material and provided with flow-through openings whereby absorption of the gas by the liquid solvent occurs partly within the pores of the filter plates, and passing the liquid solvent with the gas dissolved therein through at least one desorbing column having vertically spaced filter plates similar to those in the absorbing column for desorbing the gas from the liquid solvent.

3,665,678

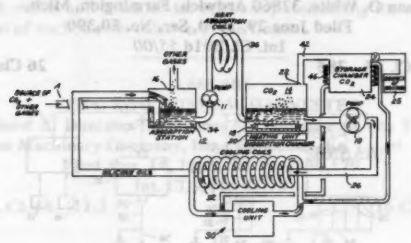
METHOD OF RECOVERING CARBON DIOXIDE FROM A FLUID

Karl Kammermeyer, and Blase J. Sollami, both of Davenport, Iowa, assignors to The Bendix Corporation

Filed Sept. 14, 1970, Ser. No. 71,812
Int. Cl. B01d 53/16; C07f 7/02
U.S. Cl. 55—68 10 Claims

A method of recovering carbon dioxide from a gaseous fluid containing carbon dioxide and other gases mutually inert to each other. The gaseous fluid is passed through silicone oils in an absorption chamber at ambient or lower temperatures where the carbon dioxide is absorbed by the silicone oils. The silicone oils, laden with carbon dioxide, is then circulated through a series of coils in contact with a heat generating apparatus. After heat from the apparatus has

been picked up, the silicone oils are then transported to a desorption chamber. In the desorption chamber the silicone oils laden with carbon dioxide is agitated and further heated. This agitation and heating along with a vacuum applied to the surface of the silicone oils in the desorption chamber causes the carbon dioxide to be given off as a gas. This gaseous carbon dioxide is transported to a storage chamber



through a conduit surrounded by cooling coils. The silicone oils are then recirculated by a pump through a conduit surrounded by cooling coils where the temperature of the silicone oils is again brought back to ambient or lower temperature before it again passes through the absorption chamber where the mixture of the silicone oils and carbon dioxide takes place.

3,665,679

ELECTROSTATIC AIR CLEANER

Bruce H. McLain; John P. Sallee, and Shirley B. Ashton, all of Nashville, Tenn., assignors to Air Control Industries, Inc.

Filed Jan. 28, 1970, Ser. No. 6,425
Int. Cl. B03c *3/47*
U.S. Cl. 55—137 **3 Claims**

An electrostatic air cleaning device including alternately charged and grounded collector plates extending between a pair of opposed insulated supporting walls. The walls are provided with recesses supporting the charged collector plates staggered relative to the grounded collector plates. A charging conductor extends transversely of the collector plates to engage the projecting edges of one set of collector plates, and a grounding conductor extends transversely of the plates to engage the opposite edges of the other set of collector plates.

3,665,680

HYDROGEN DIFFUSION APPARATUS

Gustav Heuser, Union, N.J., assignor to Engelhard Minerals & Chemical Corporation

Filed Dec. 18, 1970, Ser. No. 99,466
Int. Cl. B01d *53/22*
U.S. Cl. 55—158 **4 Claims**

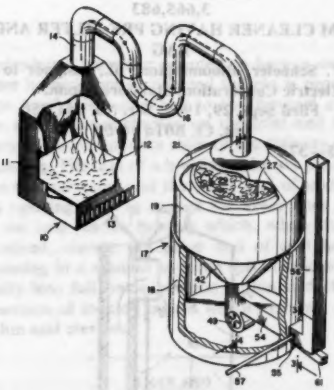
A hydrogen diffusion apparatus for the purification of hydrogen comprising a tubular housing having closure means at opposite ends thereof, an outlet means through the wall of the housing, an elongated support means located internally of and longitudinally of the housing and having opposite ends each mounted on one of the closure means, a non-porous hydrogen-permeable thin-walled metal tube in the form of an elongated coil coaxially mounted on the support means, opposite ends of the tube extending from the coil and each passing through the wall of one of the closure means, a metal strip member passing between the coil and the support longitudinally thereof and at one end attached thereto, the strip having hook-like members on opposite end portions thereof, the hook-like members embracing opposite ends of the coil, whereby the coil is permitted only limited movement on the support.

3,665,681

SMOKE CLEANING APPARATUS

Andrew H. Vitenko, 600 West 146th Street, Apt. 43, New York, N.Y.

Filed Oct. 13, 1970, Ser. No. 80,321
Int. Cl. B01d *50/00*
U.S. Cl. 55—260 **4 Claims**



A smoke cleaning apparatus has been provided for effecting the cleaning of the smoke particles from the smoke and the absorption of the gasses by water spray or pressure injected devices. The apparatus is formed of top and bottom parts, a mesh basket supported on the bottom part and a filter supporting ring disposed in the mesh basket and having vertically spaced inwardly extending flanges and a filtering mass unit having a tapered side surface fitting and conform-

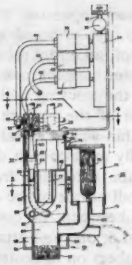
ing generally to the edges of the inwardly extending flanges of the ring to provide annular spaces about the filtering mass communicating with the tapered side face of the filtering mass to allow for entry and re-entry of the smoke into the filtering mass to provide for maximum use of the filtering material. A suction fan is provided in the bottom part for effecting generally the suction of the smoke through the filtering mass and in the outward conduit from the suction fan the water spray, or the water injected cylinder device is connected.

3,665,682

DENTAL EVACUATION APPARATUS

Anthony Ciavattoni; William Hammen, and Karl Helmur, all of Staten Island, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 6, 1970, Ser. No. 62,242
Int. Cl. A61c *17/04*
U.S. Cl. 55—337 **8 Claims**



A dental evacuation unit has a plurality of evacuation devices, each of the devices being connected to a common separator by its respective debris conducting line, and each line having a venturi located therein. Gas supply means are provided for selectively directing a flow of gas through one of the venturis toward the separator, thus creating a suction at the selected device to carry entrained matter through the respective debris conducting line to the separator. Distributing means are provided for diverting a minor portion of the gas flow to each of the other venturis to create a minor suction at the other devices to prevent unfiltered gas within the separator from escaping through the other debris conducting line.

3,665,683

VACUUM CLEANER HAVING PRE-FILTER AND DUST BAG

Harold W. Schaefer, Bloomington, Ill., assignor to National Union Electric Corporation, Stamford, Conn.

Filed Sept. 29, 1969, Ser. No. 861,950
Int. Cl. B01d *46/02*
U.S. Cl. 55—372 **2 Claims**

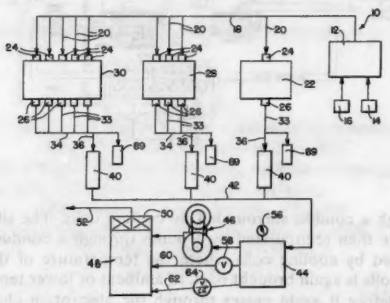
A pre-filter for a vacuum cleaner having a disposable filter bag collecting the dirt from the air stream passing through the cleaner. The pre-filter is located in the air stream of the vacuum cleaner before the stream reaches the disposable filter bag. The pre-filter comprises a fine dirt entrapping material the surface of which contacts and removes the fine dirt which tends to clog the filter bag and thus prevents the filter bag from becoming clogged by the fine dirt.

3,665,684

OIL MIST RECLASSIFYING SYSTEM

Norman O. White, 32860 Ardwich, Farmington, Mich.

Filed June 29, 1970, Ser. No. 50,390
Int. Cl. B01d *55/00*
U.S. Cl. 55—385 **26 Claims**



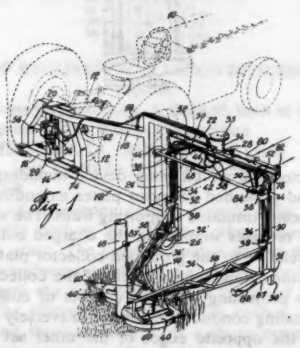
Oil mist is created by an oil mist generator, producing micro particles of oil in air by controlling the air pressure to a venturi of the mist producer, generating oil mist at a rate up to 2.5 or more cubic feet per minute. The oil mist rate is directly related to the bearing inches of spindle bearings, boring mill bearings, gear boxes, etc., requiring and served with lubricating oil mist. The system of this invention is designed to receive pressurized oil mist from the vent side of a bearing area, reclassify it into oil droplets, and collect such oil droplets for re-use or discard. A reclassifying valve in the pressurized oil mist system effects reclassification and accumulation of the micro particles of oil from the mist as a component of a vacuum system. The reclassifying valve provides constant visual confirmation of oil mist collection and signals the effective operation of the vacuum system with respect to the oil mist pressure in the valve.

3,665,685

MOWING DEVICE FOR CUTTING VEGETATION ADJACENT A FENCE

Jean Allard, 2690 Desaulniers, St-Hyacinthe, Quebec, Canada

Filed July 6, 1970, Ser. No. 52,278
Int. Cl. A01d *35/26*
U.S. Cl. 56—10.4 **21 Claims**



A device for cutting vegetation on both sides of a fence, comprising, a chassis adapted to be pivotally mounted behind

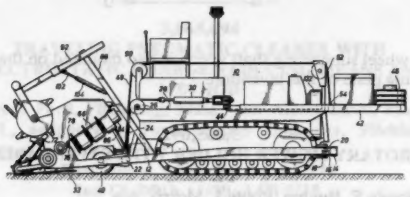
a tractor so as to be pulled in various angular positions relative to the tractor, a frame having a reverse U-shape including a base and two pending legs, the said base being pivotally connected to the chassis about a substantially vertical axis, two L-shaped members having a vertical arm and a horizontal arm, each vertical arm is pivotally connected to each leg of the frame about a vertical axis, two lawn-mowers for cutting vegetation, each lawn-mower is rigidly secured at the end of each of the said horizontal arms, connection between said two members for biassing the two lawn-mowers towards each other, and a holder for resiliently restraining the movement of each mower relative to the frame.

3,665,686

TWO ROW WINDOW HARVESTER

Richard A. Duncan, Thibodaux, La., assignor to The Thomson Machinery Company, Inc., Thibodaux, La.

Filed Aug. 14, 1969, Ser. No. 850,179
Int. Cl. A01d *45/10*
U.S. Cl. 56—11.3 **16 Claims**



Cane harvesting equipment is provided which comprises a tractor and means for supporting harvesting equipment on the tractor. The means for supporting the harvesting equipment includes a support member which is pivotally connected to the rear of the tractor and extending to the front thereof to permit raising and lowering its front portion carrying; the harvesting equipment and permit tilting from side to side. A cable is attached to the support in front of the pivotal attachment of the support to the tractor. The cable is hydraulically operated for lifting and lowering the front end portion of the support which carries the harvesting equipment. A second cable which is counterbalanced is also attached to this forward portion of the support. Preferably three or more wheels are pivotally mounted on the support for gauging the height of the cane cutting means. The gauge wheels are individually adjustable for height. An adjustably inclined pivotally mounted cane conveyor is mounted on the support behind cane pick-up means and adapted to move the cut cane laterally to the side of the harvester. A screw conveyor suspended for horizontal and vertical adjustment above the cane cutting means may be provided for moving the tops of cut cane in the same lateral direction that the cane is moved on the conveyor. Each of the several operating parts of the harvesting equipment supported on the front of the support is either mechanically or hydraulically operated. A single clutch drives both the hydraulic and mechanical equipment so that disengagement of the clutch stops both.

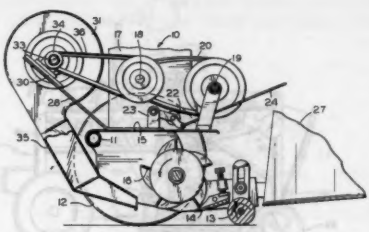
3,665,687

BLOWER ATTACHMENT FOR REEL TYPE LAWN MOWER

Jay T. Hatton, 5120 S.E. Johnson Creek Boulevard, Portland, Oreg.

Filed May 28, 1971, Ser. No. 147,786
Int. Cl. A01d *35/24*
U.S. Cl. 56—12.9 **4 Claims**

A reel type lawn mower has a blower mounted on a platform forwardly of the reel and an outlet adapted to discharge air transversely substantially along the full length of the reel, tangentially thereto, and generally parallel to the plane of the cutting blade. By this means, grass cut by the action of the



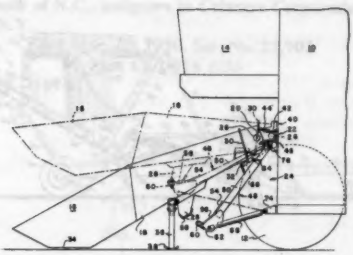
reel on the blade is blown rearwardly into a grass receiving basket disposed beneath the mower handle.

3,665,688

HARVESTER AND CONNECTOR FOR HEADER

Ronald T. Sheehan, Lancaster; Everett C. Cowan, Parksburg, and Myles Hyman, Lancaster, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed May 28, 1971, Ser. No. 147,935
Int. Cl. A01d *35/12*
U.S. Cl. 56—14.6 **7 Claims**



An agricultural harvester adapted to have a crop header and feeder housing unit connected thereto is provided with connector mechanism attached to the forward end of the harvester and includes clevises on the inlet end thereof to receive trunnions on opposite sides of the delivery end of the feeder housing. The legs of a hoisting yoke are pivotally connected to the harvester and the outer end of said yoke has upwardly opening seats to engage the lower ends of seating brackets on said feeder housing which, when the hoisting yoke is raised, elevate the outer end of said header and feeder housing in a manner to force the trunnions generally horizontally into full home position within said clevises for the connection of locking means which maintain said trunnions within said clevises.

3,665,689

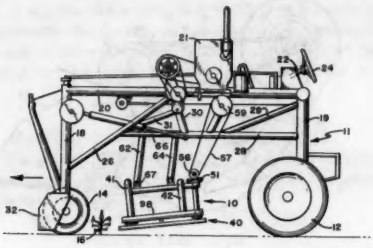
HARVESTER

Melvin K. Richardson, Clemson, S.C., assignor to Clemson University, Clemson, S.C.

Filed June 24, 1970, Ser. No. 49,259
Int. Cl. A01d *45/16*
U.S. Cl. 56—27.5 **5 Claims**

A harvester for removing pods from okra stalks or the like. A pair of endless chains are mounted on sprockets in a cutting unit supported by a mobile unit, the chains having plates with angular notches on their inner, meeting course.

Each pair of opposed plates close upon the stalk forming a ring around the same and the plates move upwardly on the



stalk, and rearwardly, as the mobile unit moves forwardly thus removing the pods from the stalks.

3,665,690

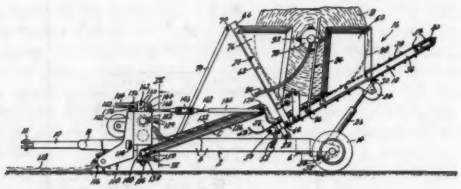
HAY BALING MACHINE

Louis Wenger, 1504 Lake View Drive, Sabetha, Kans.

Filed Feb. 8, 1971, Ser. No. 113,549

Int. Cl. A01d *39/00*

U.S. Cl. 56—341 **13 Claims**



A hay baling machine consisting of a wheeled frame adapted to be towed, an upwardly opening V-shaped trough carried by said frame and comprising an inclined wall and a relatively angled platform, hay pick-up and transporting devices carried by said frame and operable to pick up hay from the ground and deposit it in said trough, a powered rotary spindle disposed in said trough parallel to the apex thereof and movable away from said apex, and powered conveyor chains carried by said platform and movable at right angles to the apex thereof, whereby hay desposited in said trough is wound on said spindle to form a cylindrical bale constantly rotated by said conveyor chains, said spindle being removable from said bale and said platform being pivotally movable to be inclined downwardly toward its free edge, whereby said bale may be discharged to the ground.

3,665,691

EDGING ATTACHMENT FOR ROTARY LAWN MOWERS

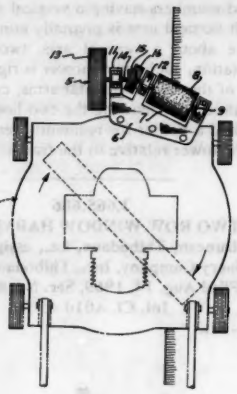
Allan H. Vaughan, 2 Larchmont Drive, Huntington, W. Va.

Filed Feb. 5, 1971, Ser. No. 113,011

Int. Cl. A01d *55/18*

U.S. Cl. 56—255 **5 Claims**

This invention consists of a horizontally disposed cylindrical wire brush that is located in an elongated U-shaped opening in a supporting plate which is suitably secured at an angle on the front end of a rotary lawn mower. The aforesaid wire brush is supported by a shaft whose ends project into two bearings mounted on the just-mentioned supporting plate. One end of the aforesaid shaft is provided with a gear, which is in mesh with a second gear that is secured to the outer end



of a wheel supporting shaft which is also mounted on the supporting plate of this invention.

3,665,692

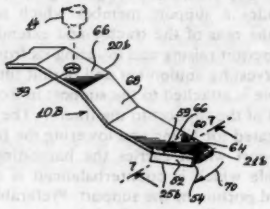
ROTARY MOWER HOLDER WITH EXPENDABLE BLADES

Benjamin F. Hughes, Route 1, Morris, Ala.

Filed Jan. 2, 1970, Ser. No. 263

Int. Cl. A01d *55/18*

U.S. Cl. 56—295 **1 Claim**



A blade and holder assembly for a power driven rotary type mower has a bar mountable on the shaft of the driving motor of the mower. Ends of the bar are bent on transverse axes to form flanges which define blade receiving channels with opposite end portions of the bar. Expendable blades have backs which removably engage in the channels. The blades are held in place by frictional engagement and centrifugal force of rotation of the bar. Supplementary retaining screws may be provided. Blades may have two cutting edges and may be reversible in the retaining flanges.

3,665,693

MOWER GUARD

Herbert R. Dacus, 1089 Madrid, Rockledge, Fla., and Harry V. Christner, 795 Newfound Harbour Drive, Merritt Island, Fla.

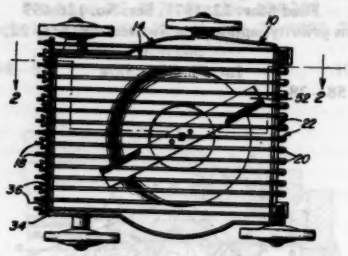
Filed Mar. 23, 1971, Ser. No. 127,280

Int. Cl. A01d

U.S. Cl. 56—320.1 **8 Claims**

A guard or safety shield comprising a plurality of laterally spaced parallel rods mounted beneath the rotary blade of a rotary lawn mower in a manner so as to define uninterrupted longitudinal grass paths. Each rod has the forward end thereof suspended from the overlying housing front wall by a

narrow generally vertical member, these members acting to maintain the grass upright and guide the grass into the grass paths. The front wall of the mower has an elevated lower



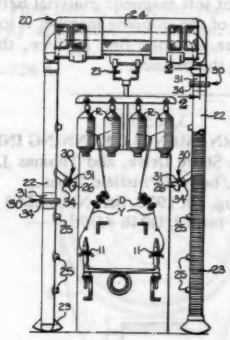
edge with the rotary blade being located at a heighth approximately midway between the lower edge of the front wall and the underlying guard rods.

3,665,694

TRAVELING PNEUMATIC CLEANER WITH ELECTROSTATIC CHARGE REDUCING MEANS AND METHOD

Maynard Ford, Fitchburg, Mass., and Albert Davis, Mason, N.H., assignors to Parks-Cramer Company, Fitchburg, Mass.

Filed Dec. 4, 1970, Ser. No. 95,176
Int. Cl. D01h *11/00*; A47l *5/38*
U.S. Cl. 57—34 R **11 Claims**



The formation of textile materials into strands by a textile strand forming machine such as a spinning frame is facilitated by reduction of electrostatic charges produced in forming the strand, through the combination of a device, preferably a traveling pneumatic cleaner, which sequentially directs an air stream toward strands being formed and an electrical charging device for electrically charging the air stream.

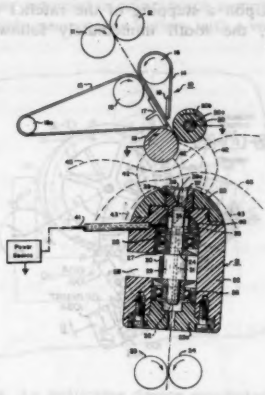
3,665,695

TEXTILE MACHINE

Richard A. Amato, Bolton, Mass., assignor to Electrospin Corporation, Columbus, Ohio

Filed Aug. 25, 1970, Ser. No. 66,716
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.91 **4 Claims**

An electrostatic spinning apparatus in which the electrostatic field through which textile fibers are caused to flow is enhanced, and has a stabilized configuration by minimizing the transient charge accumulation in the area adapted to



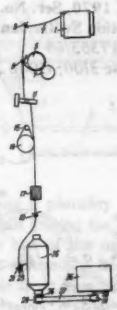
receive the fibers and by mitigating air turbulence so as not to disrupt the desired flow path of the fibers.

3,665,696

YARN PACKAGING

Louis Gubinsky, Matthews, and Stephen D. Murphy, Charlotte, both of N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 23, 1970, Ser. No. 21,902
Int. Cl. D01h *1/36*
U.S. Cl. 57—157 F **7 Claims**



During a constant tension programmed spindle speed drawtwisting operation, decreased twist insertion below a minimum acceptable value is compensated for by passing the yarn through fluid jet interlacing means prior to take-up.

3,665,697

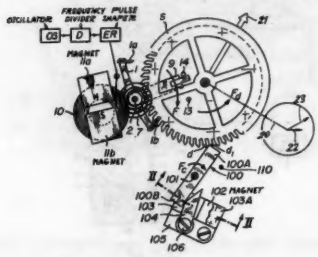
DRIVING MECHANISM FOR ELECTRONICALLY CONTROLLED TIMEPIECE

Peter Dome, 1249 Athenaz, Geneva, Switzerland, assignor to Societe Suisse Pour L'Industrie Horlogere S.A., Geneva, Switzerland

Filed Nov. 18, 1970, Ser. No. 90,573
Claims priority, application Switzerland, Nov. 20, 1969, 17281/69
Int. Cl. G04c *3/04*
U.S. Cl. 58—23 D **10 Claims**

A ratchet wheel in the driving mechanism of a timepiece, having pointed teeth alternately engageable by a pair of dogs

on opposite ends of an electromagnetically impelled balance lever, coacts with a retaining pawl in the form of a bar or reed swingable about a fulcrum on a line perpendicular to the trailing flank of a tooth engaged by a transverse end face of the pawl. Upon a stepping of the ratchet wheel by the balance lever, the tooth immediately following the one



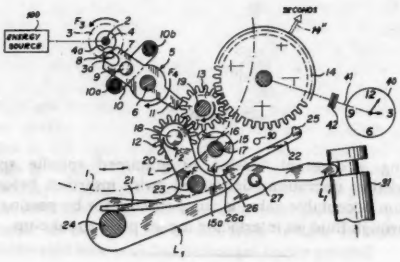
heretofore engaged by the pawl strikes a side face thereof with sufficient force to drive the end face of the pawl out of the orbit of the ratchet teeth, against a magnetic or elastic biasing force, so that this following tooth can move into the engagement position without further contact with the pawl until the latter returns to its blocking position.

3,665,698

ELECTROMECHANICAL CLOCKWORK WITH DECOUPLING MECHANISM

Peter Dome, 1249 Athenaz, Geneva, Switzerland, assignor to Fabrique D'Horlogerie Chs Tissot & Fils S.A., Le Locle, Switzerland

Filed Nov. 18, 1970, Ser. No. 90,572
Claims priority, application Switzerland, Nov. 22, 1969, 17353/69
Int. Cl. G04c *3/00*; **G04b** *27/06*
U.S. Cl. 58—23 **10 Claims**



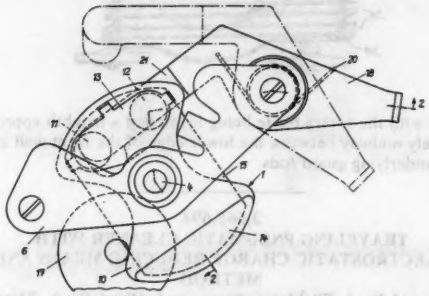
A continuously operating rocking member coacts with a pair of meshing pinions to step a gear train of a clockwork for a watch, one of the gears of this train being in mesh with the first pinion and being also positively coupled with the seconds hand of the watch incorporating the clockwork. Manual actuation of a release mechanism, preparatorily to the resetting of the watch hands, trips a lever which retracts the other pinion from the sweep of the drive member and also immobilizes the driven gear in mesh with the first pinion, enabling continued reciprocation of the rocking member during readjustment of the timepiece.

3,665,699

DEVICE FOR LOCKING AN ELECTRO-DYNAMICALLY MAINTAINED BALANCE/BALANCE-SPRING

Claude Challandes, Sonceboz, Switzerland, assignor to Centre Electronique Horlager SA, Neuchatel, Switzerland

Filed Mar. 22, 1971, Ser. No. 126,459
Claims priority, application Switzerland, May 22, 1970, 5657/70
Int. Cl. G04c *3/04*
U.S. Cl. 58—28 **4 Claims**



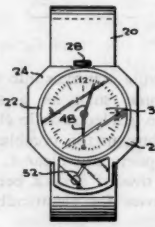
A balance locking device for an electro-dynamically maintained balance/balance-spring assembly comprises a stopping member movable between a first position in the immediate vicinity of the balance, and a second position spaced away from the balance. The balance carries at least one permanent magnet and a plate of soft magnetic material between which a soft magnetic part of the stopping member is located when the stopping member is in the first position, the magnetic forces set up locking the balance.

3,665,700

WATCH WITH ORNAMENTAL RUNNING INDICATOR

James S. Ditello, 44 Shore Drive, and Thomas J. Ditello, 43 Rhode Island Ave., both of Pittsfield, Mass.

Filed Aug. 10, 1970, Ser. No. 62,565
Int. Cl. G04b *45/00*
U.S. Cl. 58—57 **6 Claims**



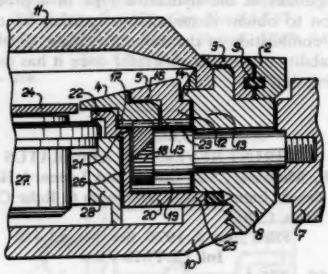
A wrist watch is provided with a case in which a radial casing extension houses a pendulum visible concurrently with and adjacent the face of the watch with the pendulum being connected to an extension of the pallet arbor of the watch to be oscillated during operation of the watch so that the pendulum provides a moving indication that the watch is operating and also provides an ornamental effect.

3,665,701

WATCH CASE WITH MULTIPLE INTERNAL AND EXTERNAL ROTATABLE DIALS

Georges Burdet, Damprichard, France, assignor to Ets. Meyer & Grandgirard S.A., Gambetta, Besancon, France

Filed Apr. 15, 1971, Ser. No. 134,261
Claims priority, application France, Apr. 21, 1970, 7014437
Int. Cl. G04b *39/00*
U.S. Cl. 58—91 10 Claims



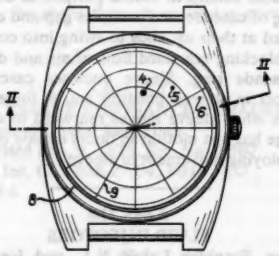
A watch case comprises two adjacent annular graduated discs rotatably mounted inside a caseband. The discs are supported on an annular frame member including an upper flange for guiding the inner disc and a lower flange clamped between the caseband and a bottom.

3,665,702

TIMEPIECES

Pierre Calame, Chapelle, Switzerland, assignor to Zodiac SA, Le Locle, Switzerland

Filed Dec. 4, 1970, Ser. No. 95,028
Claims priority, application Switzerland, Dec. 5, 1969, 18149
Int. Cl. G04b *19/00*
U.S. Cl. 58—126 A 2 Claims



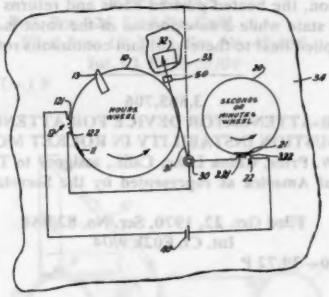
A timepiece comprises a plurality of transparent discs coaxially mounted within a case, each disc carrying a reference mark, each mark indicating respectively, different units of time, the discs being rotatable beneath a cover glass having a graticule marked on a surface of the cover glass.

3,665,703

MEASURING AND INDICATING ARRANGEMENT

Claus Christian Cobarg, Steinbach/Ts, Germany, assignor to Braun Aktiengesellschaft, Frankfurt/Main, Germany

Continuation-in-part of application Ser. No. 781,935, Dec. 6, 1968, now Patent No. 3,591,957. This application Mar. 9, 1971, Ser. No. 122,451
Claims priority, application Germany, Dec. 8, 1967, P 15 91 859.9
Int. Cl. G04b *47/06*; G04c *3/00*
U.S. Cl. 58—152 H 10 Claims



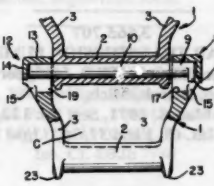
An arrangement for measuring the voltage of a battery to determine the state of charge of the battery when used to operate electrical timepieces. A pair of momentary contact switches are actuated by the hours wheel of the clock mechanism on the one hand, and by either the minutes wheel or the seconds wheel of the clock mechanism on the other hand, and when actuated in coincidence complete an electrical circuit which connects the battery with a voltage measuring instrument. An indicating device associated with the instrument indicates the measurement taken and is held in place by a holding device, after the measurement has been completed. The indicating device becomes released and permitted to turn to its initial position prior to the instant when a subsequent measurement is to be taken.

3,665,704

DRAG CHAIN

Francis E. Trudeau, Chicago Heights, Ill., assignor to Portec, Inc., Chicago, Ill.

Filed June 16, 1969, Ser. No. 833,536
Int. Cl. F16g *13/06*
U.S. Cl. 59—85 5 Claims



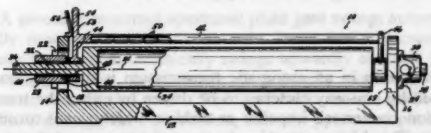
A drag chain having a plurality of similar links pivotally connected by a lock pin joining the spaced apart side arms of one link to the cross bar of the next link. Retention of the positioned lock pin is assured by keeper heads at the ends of the side arms, shiftable from an access to a closed position.

3,665,705

THERMAL ENGINES

Edwin S. Christensen, 2203 North Santa Fe Avenue, Compton, Calif.

Filed Nov. 10, 1969, Ser. No. 875,088
Int. Cl. F03g *7/06*
U.S. Cl. 60—23 7 Claims



A thermal engine capable of converting heat directly into rotary motion and having only one prime moving part. A

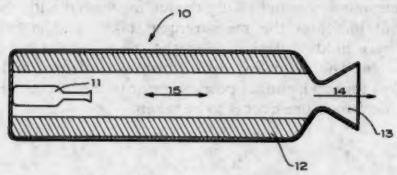
cylindrical rotor member is rotatably supported between trunnioned bearings so that longitudinal deformation of the rotor is limited to a predetermined direction. Heat is applied to the rotor offset from such direction and in attempting to deform in response to the applied heat, the rotor rotates about its longitudinal axis toward the such direction where the trunnioned bearings permit such deformation. Once in this position, the heated portion cools and returns to a non-deformed state while a new portion of the rotor is deformed by the applied heat to thereby obtain continuous rotation.

3,665,706

IGNITER-ATTENUATOR DEVICE FOR ATTENUATING COMBUSTION INSTABILITY IN ROCKET MOTORS

Edward W. Price, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1970, Ser. No. 82,881
Int. Cl. F02k *9/04*
U.S. Cl. 60—39.72 P **3 Claims**



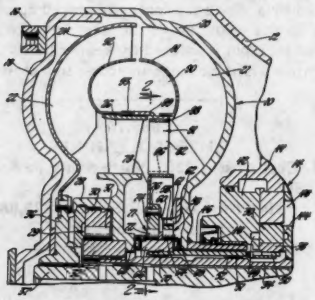
A device for attenuating oscillatory combustion in solid rocket motors which comprises an igniter-attenuator device attached at the forward end of a rocket motor combustion chamber so that oscillatory combustion is effectively attenuated.

3,665,707

VEHICULAR TRANSMISSION PUMP DRIVES

Erkki A. Kolvunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 8, 1971, Ser. No. 122,041
Int. Cl. F16d *31/06, 33/00*
U.S. Cl. 60—54 **4 Claims**



The pump in an automatic transmission is drivingly connected by one-way clutches to be driven by either the transmission converter's impeller or turbine, whichever is turning faster. The drive connection between the pump and the converter's turbine is provided by a drive member which extends through the converter's flow circuit and around the converter's stator in the converter's eye to connect to the turbine.

3,665,708

GAS GENERATION PROCESS USING METAL CARBONYLS AS ADDITIVES

William A. Duncan, and James A. Murfree, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 1, 1969, Ser. No. 863,757
Int. Cl. C06d *5/10*
U.S. Cl. 60—220 **5 Claims**

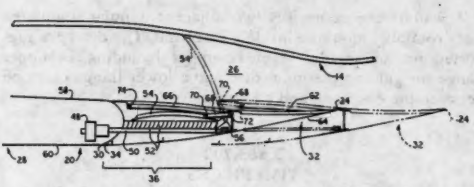
Metal carbonyls are utilized with an oxidizer and a monopropellant of the hydrazine type in a process of gas generation to obtain instantaneous ignition, to obtain very vigorous combustion of the monopropellant, and to increase the startability of the gas generator once it has cooled down from being shut off.

3,665,709

THRUST REVERSING APPARATUS

George E. Medawar, San Diego, and Leonard Holman, Imperial Beach, both of Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed June 4, 1970, Ser. No. 43,470
Int. Cl. F02k *3/06*
U.S. Cl. 60—226 A **4 Claims**



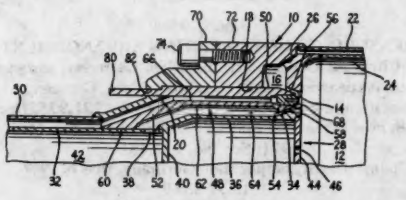
Fan jet engine has cowl surrounding engine and terminating in jet exhaust nozzle. Elongate shroud surrounds fan and engine to define annular passage for fan air terminating forward of exit end of nozzle. Aft portion of shroud is separate sleeve movable axially to define peripheral outflow gap for fan air. Ring of cascade sets occupies gap and carries blocker doors pivoted at their aft ends to swing into contact with engine cowl, blocking rearward flow of air and diverting it out through cascade ring. Sleeve encloses cascade ring and blocker doors in stowed position and is linked to doors to deploy them when sleeve moves rearward to deployed position. Linkage has lost motion so doors deploy only during last stage of deploying movement of sleeve.

3,665,710

FLUID INJECTORS

Joseph Ficon, Franklyn Lakes, N.J., and Joseph Clemente, Gatersburg, Md., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Dec. 27, 1966, Ser. No. 605,008
Int. Cl. F02k *9/02*
U.S. Cl. 60—258 **2 Claims**



A rocket motor fluid injector having internal fluid passages connecting to propellant sources and an additional passage

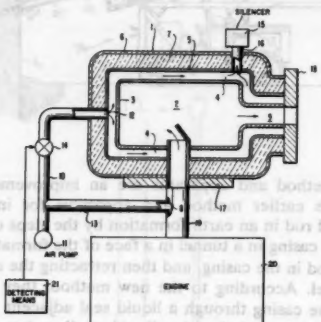
connected to a tank pressurizing gas source. A slidable pintle is also provided to throttle propellant flow while still permitting a constant gas flow into the rocket motor combustion chamber during throttling.

3,665,711

EXHAUST GAS PURIFYING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Takumi Muroki, Hiroshima, Japan, assignor to Toyo Kogyo Company Limited, Aki-gun, Hiroshima, Japan

Filed June 9, 1970, Ser. No. 44,847
Claims priority, application Japan, June 6, 1969, 44/54407
Int. Cl. F01n 3/10
U.S. Cl. 60—286 4 Claims



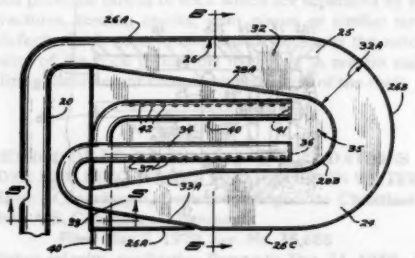
An exhaust gas purifying device disposed in the exhaust system of an internal combustion engine which device has an inner shell forming a reaction chamber for reburning the exhaust gas and an outer shell surrounding the space outside of the inner shell. An air pump driven by the engine cools the inner and outer shells by introducing cooling air into the space between the shells through an engine parameter controlled valve.

3,665,712

TWO-CYCLE ENGINE RESONANCE EXHAUST SYSTEM

William L. Tenney, Crystal Bay, Minn.

Filed Feb. 9, 1970, Ser. No. 9,507
Int. Cl. F02b 27/04; F01n 5/00
U.S. Cl. 60—314 24 Claims



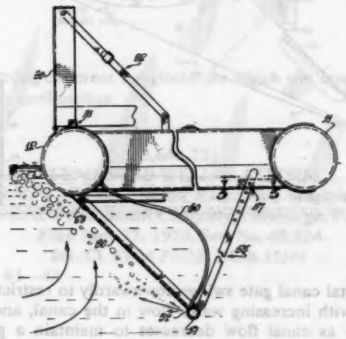
Two-cycle engine exhaust systems including a resonance chamber which has at least one change of direction or bend in the resonance chamber and which is used in combination with powered tools and vehicles, such as chain saws and snowmobiles. Bending the resonance chamber saves space and keeps the exhaust resonance chamber out of the way of an operator. The further improvement of including an additional silencing section located within the crook of the bend in the resonance chamber in combination with two-cycle engines, is also disclosed.

3,665,713

CONTAMINANT CONTAINMENT METHOD AND APPARATUS

Eric Rath, P.O. Box 226, La Jolla, Calif.

Filed June 18, 1970, Ser. No. 47,455
Int. Cl. E02b 15/04
U.S. Cl. 61—1 F 1 Claim



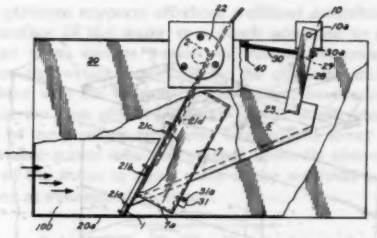
This is a method and apparatus for containment of contaminants on fluid surfaces, particularly such as oil spillages in ocean waters, wherein the use of a floating barrier with submerged shield segments carrying high pressure jets is utilized in interconnected, segmented form.

3,665,714

CANAL CHECK GATE

Mills E. Bunger, Wheatridge, Colo., assignor to William J. Laipple, Sturgeon Bay, Wis., a part interest

Filed Sept. 24, 1970, Ser. No. 75,112
Int. Cl. E02b 7/40
U.S. Cl. 61—23 8 Claims

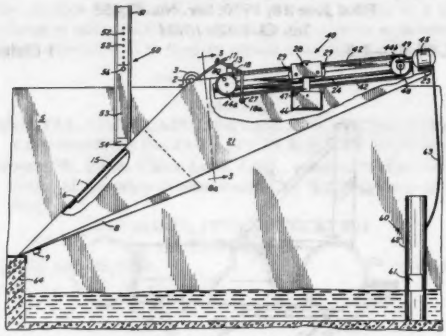


A pivotally mounted apertured plate gate swings automatically downward to restrict flow in a canal with increasing water flow and automatically swings upwardly as canal flow decreases so as to maintain a generally constant head downstream in the canal. The automatic action is accomplished through the cooperation, with the apertured plate, of a plate counterweight structure, valved tank for receiving water through the plate aperture, and a sliding blade gate controlling inflow through the plate aperture. Manual control is also possible.

3,665,715
CANAL CHECK GATE APPARATUS

Mills E. Bunger, 3850 Harlan, Wheatridge, Colo.

Filed Apr. 28, 1971, Ser. No. 138,199
Int. Cl. E02b 7/40
U.S. Cl. 61—25 9 Claims

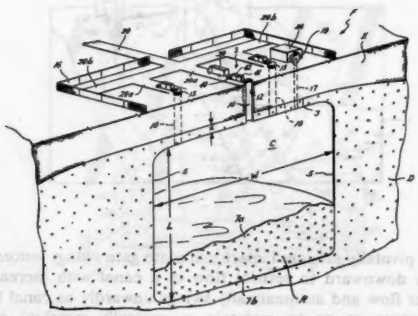


A pivotal canal gate swings downwardly to restrict flow in a canal with increasing water flow in the canal, and swings upwardly as canal flow decreases to maintain a generally constant head downstream of the gate. Apertures in the gate connect to a tank on the back of the gate, water flowing into the tank is drained downstream through a valve in the tank at a predetermined rate. A member slidably mounted on the gate and levered over a fixed fulcrum progressively opens or closes the apertures accordingly as the gate swings upwardly or downwardly. A selectively positionable counterweight on a moment arm extending from the back of the gate allows selected counterbalancing.

3,665,716
REFUSE DISPOSAL METHOD

Z. W. Rogers, P.O. 12247 Waldeman Drive, Houston, Tex., and William L. Kirk, P.O. Box 8702 Ruthby, Houston, Tex.

Filed Aug. 10, 1970, Ser. No. 62,334
Int. Cl. E02d
U.S. Cl. 61—35 7 Claims

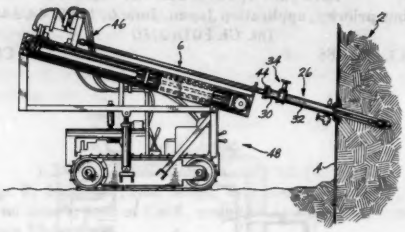


Refuse is collected, transported and then deposited in an impermeable cylindrical solution cavity formed within a subterranean rock salt formation. The air containing noxious odors and excess heat is extracted from the solution cavity purified and then released into the atmosphere.

3,665,717
METHOD AND APPARATUS FOR INSTALLING ELONGATED RODS IN UNSTABLE EARTH FORMATIONS

Gerald T. Sweeney, and Oliver E. Erdman, both of Tacoma, Wash., assignors to Soil Sampling Service, Inc., Puyallup, Wash.

Filed Jan. 14, 1971, Ser. No. 106,341
Int. Cl. E02d 5/74
U.S. Cl. 61—39 19 Claims

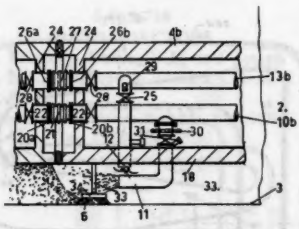


The method and apparatus are an improvement on the patentee's earlier method and apparatus for installing an elongated rod in an earth formation by the steps of installing a tubular casing in a tunnel in a face of the formation, inserting the rod in the casing, and then retracting the casing from the tunnel. According to the new method, they install and retract the casing through a liquid seal adjacent the face of the formation, and charge a liquid medium into the tunnel through the seal to pressurize the tunnel about the casing, and to retain the formation about the rod when the casing is retracted from the tunnel.

3,665,718
METHOD OF FILLING A SPACE UNDER A STRUCTURAL ELEMENT AND STRUCTURE THEREFOR

Albert Griffioen, Utrecht; Jan Hofmeijer, Rijswijk; Paul Cornelis Van Milligen, Roggekamp; Jorn Yding Tonnisen, Oegstgeest, and Jacobus Martinus Van Zanten, Utrecht, all of Netherlands, assignors to Combinatie Westerschelde v.o.f., Utrecht, Netherlands

Filed July 28, 1970, Ser. No. 58,775
Claims priority, application Netherlands, Mar. 31, 1970, 7004556
Int. Cl. E02d 29/00; E01g 3/00
U.S. Cl. 61—43 9 Claims



In a known method of filling a space under a structural element with sand, sand and water are supplied into said space through a suspension conduit communicating with a suction dredging installation, rolling on and guided by said structural element, extending above the water level and sucking sand from barges. This suction dredging installation obstructs the shipping and cannot be used at bad weather conditions and/or great depth. For avoiding the above disadvantages the invention provides a method in which the suspension is sup-

plied through a suspension conduit fixed to the structural element, and extending from a junction side of said structural element.

3,665,719

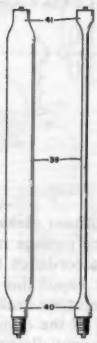
APPARATUS FOR COUNTERSTRESSING IN SITU ROCK FOR SUPPORT OF UNDERGROUND OPENINGS

Jerry M. Whiting, Rifle, Colo., assignor to Atlantic Richfield Company

Original application May 28, 1969, Ser. No. 828,513, now Patent No. 3,568,450. Divided and this application July 27, 1970, Ser. No. 58,388

Int. Cl. E21d *21/00*

U.S. Cl. 61—45 F **1 Claim**



In rock surrounding an underground excavation which must have a man-made support system to ensure a required degree of structural stability and which is subjected to certain stress conditions, an inflatable device or rock jack is inserted into a drill hole or slot in the rock. The rock jack is inflated slightly by fluid pressure to take up any space between the jack and the in situ rock and is subsequently pressurized to the limit of its capability. High compressive force is transmitted to the rock, thus creating compressive stress in monolithic rock and increasing confinement of and friction between proximal blocks of rock which are separated by narrow fractures, tension cracks, joint planes or similar structural defects. Such action maintains or increases the natural capability of the rock to support itself and to remain stable by utilizing the inherent compressive strength of the rock.

3,665,720

METHOD OF STABILIZING SAND FOUNDATIONS UNDER BUILDING WORKS SUBMERGED IN WATER

Kaj Havn , Copenhagen, Denmark, assignor to Christiani & Nielsen A/S, Copenhagen, Denmark

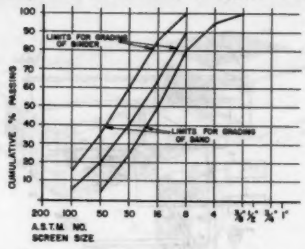
Filed May 8, 1970, Ser. No. 35,688

Claims priority, application Denmark, Dec. 11, 1969, 6558/69

Int. Cl. E02d *3/12*

U.S. Cl. 61—46 **4 Claims**

A method of stabilizing sand foundations under building works submerged in water including pumping in sand to which a small percentage of hydraulic binder is added under the building work, utilizing a grain-size distribution of the hydraulic binder adjusted to the grain-size distribution of the sand to avoid separation of the binder from the sand, wherein the hydraulic binder, by hydration, cements the sand grains



into a strong coherent conglomerate which will remain unaffected by earthquakes.

3,665,721

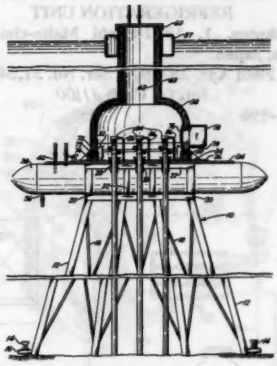
SUBMERGED WELL PLATFORM

Malcolm R. J. Wyllie, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 27, 1970, Ser. No. 40,924

Int. Cl. E02d *27/38;* **B63b** *35/44*

U.S. Cl. 61—46 **6 Claims**



A platform supports off-shore wellhead assemblies below the surface of the water at a depth adequate to eliminate danger from surface vessels or storms. Buoyancy tanks reduce the weight supported by the platform and thereby combine with the reduced weight above the ocean floor to reduce the cost of the platform. A seat is provided on the deck of the platform to receive and seal the lower end of a removable access tube that extends upwardly above the surface of the water to allow work at the wellhead to be performed at atmospheric pressure.

3,665,722

METHOD AND APPARATUS FOR MAKING A PARTIALLY FROZEN BEVERAGE

Richard T. Cornelius, Minneapolis, Minn., assignor to The Cornelius Company, Anoka, Minn.

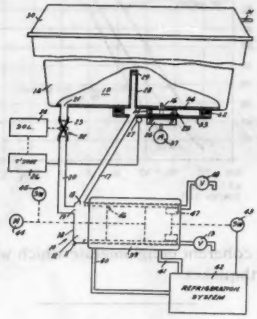
Filed Sept. 29, 1970, Ser. No. 76,402

Int. Cl. F25c *7/10*

U.S. Cl. 62—68 **20 Claims**

A method and apparatus by which liquid stored in a storage chamber passes through a filling line to a freezing chamber from which it is dispensed. The liquid in the storage chamber is continuously circulated by a circulation pump to

withdraw liquid therefrom and to return it through a standpipe having a restricted outlet. When the temperature in the storage chamber increases to a predetermined point, such temperature is sensed to cause a valve to open in a return



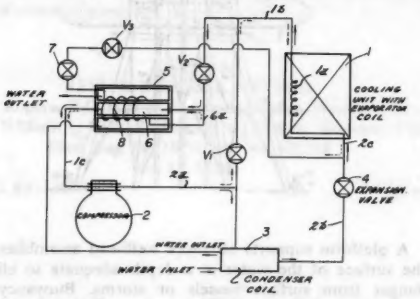
line that leads from the freezing chamber to the storage chamber whereby liquid in the storage chamber is partially replaced by refrigerated liquid which may include ice particles from the freezing chamber.

3,665,723

APPARATUS FOR DEFROSTING EVAPORATOR OF A REFRIGERATION UNIT

Teruhiko Okutus, 1, 18 Higashi Maito-cho, Minami-ku, Yokohama, Japan

Filed Apr. 23, 1970, Ser. No. 31,249
Int. Cl. F25b *41/00*
U.S. Cl. 62—196 **1 Claim**



An apparatus is provided for defrosting the evaporator coils of a conventional refrigeration unit by passing hot compressed refrigerant gas to the evaporator coil prior to any cooling, condensing or expansion of the refrigerant gas. Thereafter the refrigerant gas is condensed, expanded and recompressed for recycle for the process and apparatus.

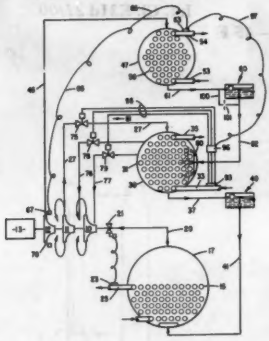
3,665,724

HEATING AND COOLING REFRIGERATION APPARATUS

Carl M. Anderson, and William T. Osborne, both of Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed July 13, 1970, Ser. No. 54,176
Int. Cl. F25b *41/00*
U.S. Cl. 62—196 **7 Claims**

Refrigerant is passed from a stage other than the last stage of a multistage centrifugal compressor to a waste heat condenser for liquefying refrigerant and returning it to a cooling load evaporator. The latent heat of the refrigerant, along with the heat of compression, is rejected to the atmosphere as by a cooling tower and interconnecting water circuit. There is capacity control means for regulating refrigerant flow from the evaporator to the compressor in accordance with the cooling load imposed on the evaporator. A line is provided for passing refrigerant vapor from the last stage of the compressor to a second condenser, which serves as a heat exchanger for heating a medium for satisfying a heating load demand. A refrigerant line extends from the second condenser to the first condenser. The compressor includes flow



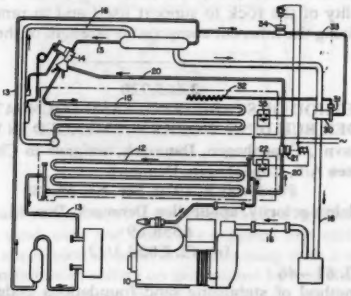
control means, as a diffuser sleeve valve, in the last stage operable to regulate the passage of refrigerant vapor to the second condenser in accordance to the heat load imposed thereon. A refrigerant vapor line including a flow control valve extends from the vapor area of the first condenser to the inlet of each stage of the compressor. The flow control valves are operated sequentially according to the pressure in the first condenser to provide a sufficient supply of refrigerant vapor for passage from the last compressor stage to the second condenser to satisfy the heat load impressed thereon.

3,665,725

CAPACITY CONTROL FOR COMPRESSION EXPANSION REFRIGERATION SYSTEMS

John W. Barlass, Excelsior, and Lowell B. Naley, St. Louis Park, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Jan. 18, 1971, Ser. No. 107,246
Int. Cl. F25b *41/00*
U.S. Cl. 62—196 **5 Claims**



A compression expansion refrigeration system is provided with a hot gas line to connect hot gas from the compressor

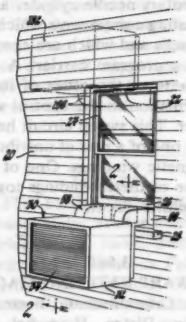
directly to the expansion coil for reducing its capacity and a servo operated suction pressure modulation valve is provided in the intake line to the compressor to vary the capacity of the system to obtain a controlled load temperature. Thermostatic control means disables the servo operated modulation valve in the open position and maintains closed a valve in the hot gas line to provide maximum capacity so long as the controlled temperature is above a predetermined amount above the desired controlled temperature and when the controlled temperature falls below the predetermined amount the valve in the hot gas line is opened to provide a direct step reduction in capacity and the suction modulation valve is activated to vary the lowered capacity to obtain the desired controlled load temperature.

3,665,726

AIR CONDITIONER WITH ROTATABLE SNORKEL

John J. Preotle, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 8, 1970, Ser. No. 44,338
Int. Cl. F25d *23/12*
U.S. Cl. 62—262 **1 Claim**



In the preferred form, a rectangular air conditioner is adapted to be mounted above, below or on either side of a window outside a building. It is provided with a snorkel type inlet and discharge duct capable of being connected to the air inlet and discharge of the air conditioner in at least four different orientations for communication through a portion of the window with a room inside the building. The electrical control unit may be provided on the room exposed portion of the snorkel duct and connected by conductors extending through the duct to the electrically powered units of the air conditioner.

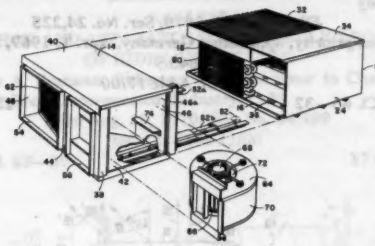
3,665,727

SECTIONALIZED SELF-CONTAINED AIR CONDITIONING UNIT

John C. Mather, Clarksville, Tenn., assignor to The Trane Company, La Crosse, Wis.

Filed Sept. 14, 1970, Ser. No. 71,991
Int. Cl. F25d *23/12*
U.S. Cl. 62—262 **7 Claims**

An air-cooled condenser section has its own support pan capable of supporting the components of the condenser section independently of the evaporator section. The evaporator has a subframe which extends outwardly therefrom for attachment in underlying relationship to the condenser section to thereby define a self-contained unitary air conditioning unit. The evaporator section has a recessed sidewall defining a channel for conducting cooling air to a portion of the condenser section embraced by the evaporator section. Vertically oriented compressor, heat exchangers, and blowers in



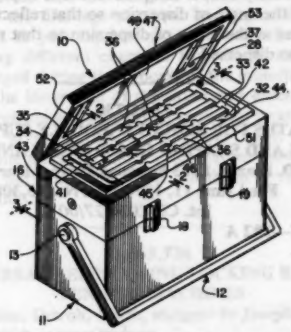
both evaporator and condenser sections permit the use of the same size bottoms, tops, and subframe for different size units.

3,665,728

PORTABLE ICE CUBE MAKER

Daniel Stoller, 120 Dogwood Road, Roslyn, N.Y.

Filed Sept. 23, 1970, Ser. No. 74,732
Int. Cl. F25c *1/04*; F25d *3/08*
U.S. Cl. 62—320 **6 Claims**



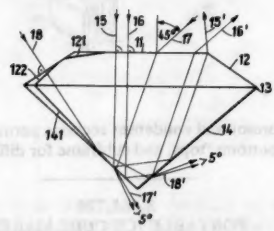
This invention provides for a portable ice cube maker, in which ice cubes are made in ice pockets provided in an insulated container having a cover and in which the ice pockets are accessable upon removing the cover, yet providing for an enclosed container space into which the ice cube pockets depend and a cover extendable over the top of the container and removable therefrom to provide access to the ice cube pockets for the addition of water or the removing of the ice cubes. An ice cube pulling extractor is provided having parrallel portions dependable into the bottoms of the ice cube pockets and transverse pull portions available at the opposite ends of the containers for effecting the pulling of the extractor and the ice cubes from the container. Refrigerant is admitted to the space within the container from a refrigerant bottle having a depressable shank extending from the neck of the bottle and the neck of the bottle extending through an opening either through the bottom of the container or through a cover thereof. A push rod is used in one form of the invention to depress the bottle shank and in the other form of the invention a shank is depressed by engaging the same with a ball valve device lying within the container space. Appropriate valves are provided for excess pressure and to prevent the admission of air into the casing and to effect the draining of the bottom of the casing.

3,665,729

CUT ORNAMENTAL GEM

Maximo Elbe, Hamburg, Germany, assignor to Colorant Schmuckstein GmbH, Harksheide, Bezirk Hamburg, Germany

Filed Mar. 31, 1970, Ser. No. 24,225
Claims priority, application Germany, Apr. 1, 1969, P 19 16 643.9
Int. Cl. A44c *17/00*
U.S. Cl. 63—32 15 Claims



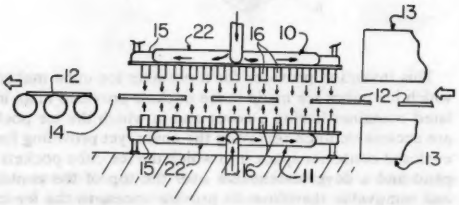
A diamond is cut to have optically cooperating first facets defining substantially the angle of dispersion so that light rays transmitted through the cooperating facets are dispersed. Second optically cooperating facets are also provided which define half the angle of dispersion so that reflected light impinges a facet at the angle of dispersion so that reflected light rays are also dispersed.

3,665,730

APPARATUS FOR SIMULTANEOUSLY SUPPORTING, COOLING AND SHAPING GLASS SHEET AND THE LIKE

Frederick D. Linzer, 1373 Foxwood Drive, Monroeville, Pa.

Filed June 11, 1970, Ser. No. 45,308
Int. Cl. C03b *27/00*
U.S. Cl. 65—182 A 15 Claims



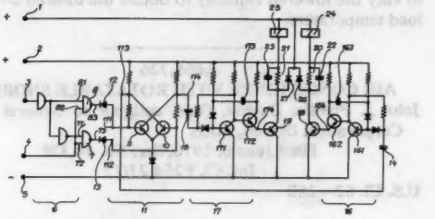
Apparatus for simultaneously supporting, cooling and shaping glass sheet and the like having heat transfer beds positioned beneath the glass sheet so that the glass sheets are supported by a gas flow through the heat transfer beds. Each heat transfer bed has manifolds for conveying a gas flow from a source to a parallel array of elongated members extending substantially transverse to the direction of travel of the glass sheet, and through cavities in said elongated members to be discharged through orifices along the length of the elongated member against the lower surface of said sheets to substantially uniformly support said sheets while cooling them. Said elongated bar members can also be contoured so that the glass sheet is gradually shaped to a desired curved shape as it is transported and cooled.

3,665,731

ELECTRICAL PATTERN MECHANISM FOR CIRCULAR KNITTING MACHINES

Gerhard Groezinger, Wurttemberg, Germany, assignor to Mayer & Cie, Tailfingen (Wuerttemberg), Germany

Filed Jan. 21, 1970, Ser. No. 4,675
Claims priority, application Germany, Jan. 24, 1969, P 19 03 432.3
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R 2 Claims



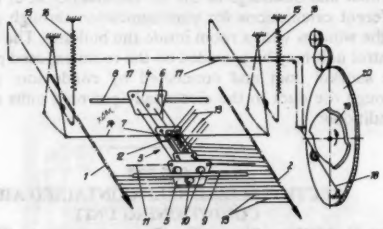
An electrical pattern mechanism for a circular knitting machine having a rotary needle cylinder and electromagnetically actuated adjusting components which act either directly on needles or on jacks and which are controlled by information derived from a program carrier. A bistable electronic sweep circuit has one or the other of its conditions determined by the information in the control signal derived from the program carrier. This sweep circuit has a pair of outputs connected through one of a pair of univibrators with one of a pair of electromagnetic windings. One of the univibrators is connected with one of these windings together with a time-limited current amplifier circuit.

3,665,732

FLAT WARP KNITTING MACHINES

Wolfgang Doring, Crimmitschau; Bertram Frenzel, Karl-Marx-Stadt; Hans-Dieter Heutschel, Karl-Marx-Stadt; Heinz Kemter, Karl-Marx-Stadt; Werner Mickenautsch, Crimmitschau II, and Harry Schmidt, Werdau, all of Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Germany

Filed Aug. 6, 1970, Ser. No. 61,596
Int. Cl. D04b *23/06*
U.S. Cl. 66—84 17 Claims



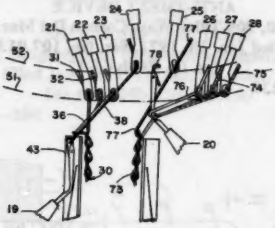
A flat warp knitting machine comprising two continuously driven endless transport chains provided with hooks, weft thread laying means, means for moving the weft thread laying means back and forth transversely to the transport chains for inserting weft threads alternately into the hooks of the two transport chains and means for moving the weft thread laying means at least partially in the direction of motion of the transport chains for the insertion of the weft threads into at least approximately opposite pairs of hooks so that the weft threads extend at least approximately at right angles to the transport chains.

3,665,733

APPARATUS AND METHOD FOR WARP KNITTING A SIMULATED WOVEN FABRIC

George E. Jackson, Charlestown, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,490
Int. Cl. D04b 23/02
U.S. Cl. 66—87 16 Claims



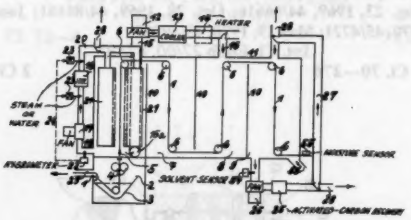
A simulated-weave, warp-knit fabric is produced on a warp knitting machine by using short latch, long shank needles combined with a high rise needle bar motion. A chopper bar is eliminated, thus freeing guide bar space while avoiding impact, dwell and delay. Either a high set chain stitch guide bar, or a needle bar timing control, may be used as a collision avoidance means. The short latch needles are wrapped in one course and different short latch needles wrapped in the next course to produce the weft appearance. There is a double guide bar stroke for each needle bar stroke, but the provision of two needle bars restores production rate to that of a one to one ratio.

3,665,734

APPARATUS FOR FINISHING FIBROUS MATERIAL

Paul Hauser, Seveso, Italy; Walter Pfister, Biehen, Switzerland; Hans Ulrich Stucki, Basel, Switzerland; Heinz Teuwen, Basel, Switzerland; Heinrich Fuhring, and Johannes Helmut Sieber, both of Augsburg, Germany, assignors to Bohler & Weber KG-Maschinenfabrik-Augsburg, Hansburg, Germany

Original application June 4, 1965, Ser. No. 462,167, now abandoned. Divided and this application Sept. 15, 1969, Ser. No. 871,361
Claims priority, application Switzerland, June 5, 1964, 7363/64
Int. Cl. B05c 3/132, 9/10, 9/12
U.S. Cl. 68—18. C 18 Claims



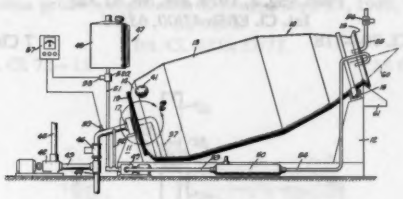
Fibrous material in web or filament form, to be dyed or otherwise chemically treated, is successively passed through a plurality of chambers including a treatment chamber in which it is subjected to the spray of a fluid, a drying chamber which may be subdivided into several compartments, and an intervening reaction chamber in which a controlled amount of moisture is added and which may be preceded by a preconditioning chamber provided with temperature-control means. Air is forcibly circulated, with the aid of a primary blower, from a location near the inlet end of the treatment chamber to a point of the drying chamber remote from the treatment chamber whereby this air passes through the interconnected chambers in counter-current to the treated material. Each chamber may also be provided with an individual secondary air path containing a blower for generating a flow which passes only through that chamber in counterflow to the treated material.

3,665,735

METHOD AND APPARATUS FOR THE BULK PROCESS OF HIDES OR THE LIKE

George A. Brennan, Fullerton, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.

Filed Aug. 19, 1970, Ser. No. 64,989
Int. Cl. C14c 15/00
U.S. Cl. 69—30 17 Claims



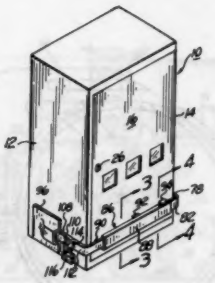
Hides or similar sheet materials of a porous and absorbent nature are processed in a liquid bath contained within a drum mounted for rotation about an axis inclined from the horizontal. The drum includes a drainage chamber proximate a lower closed end and a processing chamber adjacent an upper open end. Drainage means extending into the drum along the drum axis are adapted to drain the liquid in the drum from the drainage chamber and liquid supply means are adapted to pass liquids into the drum whereby various baths having different chemical ingredients may be added and discharged during the process of the material. Spiral fins affixed to the inner wall of the drum and extending radially inward therefrom are adapted to work and treat the material maintained in the processing chamber when the drum is rotated in one direction and are adapted to move the material towards the open end when the drum is rotated in the other direction.

3,665,736

UNIVERSAL TELESCOPING LOCKING BAR FOR VENDING MACHINES

Joseph Wilson, Detroit, Mich., assignor to Joseph MacGreene, Detroit, Mich., a part interest

Filed Jan. 15, 1971, Ser. No. 106,769
Int. Cl. E05b 65/52
U.S. Cl. 70—78 14 Claims



In a vending machine which as a front access door such as particularly a pop vending machine and in which the door is normally locked by a key lock, a safety lock bar is provided which extends across the front access door of the vending machine and over the key lock and is releasably and pivotally

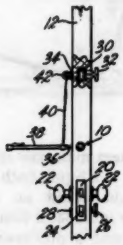
attached to the sides of the vending machine; the attachment of the lock bar is provided with invisible fasteners secured to the inside of the vending machine so as not to be accessible from the outside; the attachments are provided with apertured flanges to provide a means to secure the locking bar by means of a padlock or the like; and the locking bar is adjustable in length intermediate its ends to accomodate various widths of vending machines.

3,665,737

BURGLAR PROOF METHOD AND MEANS

Starling L. Reese, 821 East Ocean Boulevard, Long Beach, Calif.

Filed Aug. 5, 1970, Ser. No. 61,325
Int. Cl. E05b 47/00, 63/14
U.S. Cl. 70—118 7 Claims



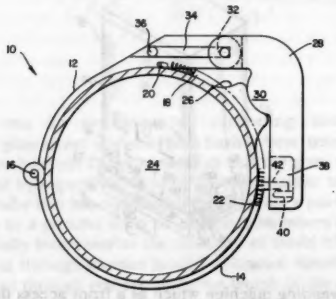
A lock mechanism forming part of a security system is mounted in a door or window and is completely concealed when the door or window is locked. The mechanism features a latch having a ferromagnetic portion and a nonferrous bolt in a nonferrous casing having a ledge defining an abutment. The latch is moved by the pull of an external magnet of predetermined strength movable along a predetermined path for locking and unlocking the door or window. The latch is maintained in locked position by engagement of its ferromagnetic portion with the abutment, which portion is disengaged from the abutment by the magnet.

3,665,738

IGNITION LOCK

Gerald F. Pescuma, Salem; Alphonse J. Durso, and Walter T. Brown, both of Lynn, all of Mass., assignors to General Products and Gear Co., Inc., Lynn, Mass.

Filed July 20, 1970, Ser. No. 56,480
Int. Cl. B60r 25/04; E05b 13/00; H01h 27/06
U.S. Cl. 70—211 7 Claims



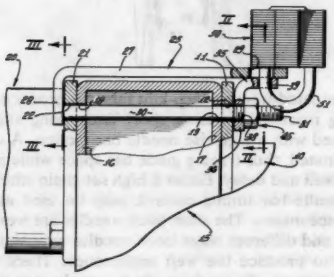
An ignition switch lock for automobiles which comprises an encircling band secured in an immovable manner to a steering column. A portion of the band comprises a pivotable blocking arm. When the blocking arm is in a closed or locked position, it engages the ignition switch and prevents entry of a key into the ignition switch. When the blocking arm is in an unlocked open position, a key may be freely inserted in the ignition switch.

3,665,739

ANTI-THEFT DEVICE

William E. Boll, 909 Tiller Way, Corona Del Mar, Calif.

Filed Jan. 18, 1971, Ser. No. 107,013
Int. Cl. E05b 65/12
U.S. Cl. 70—237 6 Claims



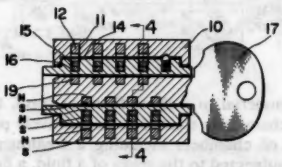
An anti-theft device for releasably locking an internal combustion engine of a land vehicle to a mating transmission by substitution of the device for one of the conventional bolts which secure the transmission housing to the engine housing thus preventing the separation of the engine and transmission by the mere removal of the conventional bolts which secure these components together. The device is disclosed for use in releasably locking together the engine and transmission of a Volkswagen automobile.

3,665,740

MAGNETIC PIN TUMBLER LOCK

Mitsumasa Taniyama, Osaka, Japan, assignor to Goal Company Limited, Osaka, Japan

Filed June 29, 1970, Ser. No. 50,397
Claims priority, application Japan, June 30, 1969, 44/51945; Aug. 23, 1969, 44/66616; Oct. 28, 1969, 44/86161; Jan. 17, 1970, 45/4721; May 19, 1970, 45/49269
Int. Cl. E05b 27/00, 47/00
U.S. Cl. 70—276 2 Claims



An improved magnetic pin tumbler lock is controllable by magnetic attraction and repulsion in such a manner that the magnetic attraction or repulsion established due to the relative positions and polarity orientations of fixed magnetic pins placed in a plurality of pin bores arranged in line in the inside face of the lock cylinder, of movable magnetic pins slidably

installed in pin bores to mate with the fixed magnetic pins, and of magnetic pieces provided in the key to be inserted through the key slot located at the center of the lock plug allow locking and unlocking of the lock. Non-magnetic pieces are associated with the movable magnetic pins and tread the shear line represented by a boundary line between the cylinder and the plug when the lock is locked.

3,665,741

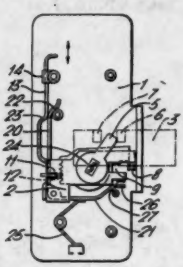
SELF-CODIFYING LOCK

Einar Holst, Skogueisan 6, 1450 Nesoddtangen, Norway

Filed Jan. 15, 1971, Ser. No. 106,723

Int. Cl. E05b *25/00, 63/00*

U.S. Cl. 70—384 **2 Claims**



Self-codifying lock of the type comprising a plurality of tumblers in a tumbler pack which, on use of a key, are orientated so that a boss or finger on the bolt of the lock achieves passage in registered slots in the tumblers. A knife member constitutes a pivotal point by engaging in one of a plurality of the notches in the rear edge of each of the tumblers. The knife member consists of a flat plate or disc moved linearly by means of an operating member, whereby the knife member is guided in guides in a frame of the lock.

3,665,742

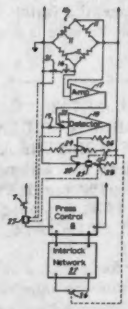
DETECTING MISSING OR DEFECTIVE CONNECTORS

Adolph E. Felt, and Joseph R. Maklary, both of Milwaukee, Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 19, 1970, Ser. No. 12,582

Int. Cl. B21j *15/28*

U.S. Cl. 72—4 **7 Claims**



A strain gage bridge is fixed to the setting anvil of a rivet head-forming press and measures the force being applied on the rivets. The strain gage bridge when unbalanced by a calibrating resistor, provides a potential which is compared by a zero crossing detector to a potential representing the formation of a proper rivet. When the potential due to the force on the rivets exceeds the potential provided by the calibrating resistor, a switching circuit is energized to avoid a press lockout. Otherwise, the switching circuit locks the punch press to prohibit a new cycle from being initiated until the switching circuit is reset.

3,665,743

MEASURING AND CONTROL APPARATUS

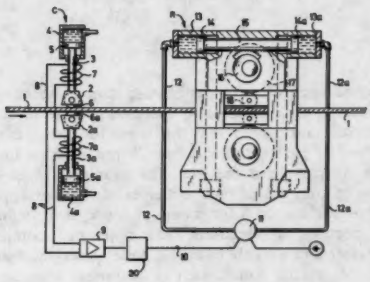
Josef Frohling, Konigshergerstrasse, Olpe, Germany

Filed Sept. 19, 1969, Ser. No. 859,342

Claims priority, application Germany, Sept. 23, 1969, P 17 98 305.0

Int. Cl. B21b *37/12*

U.S. Cl. 72—11 **14 Claims**



For controlling the processing of strip metal in for example a rolling mill, apparatus is provided ahead of the press to derive a signal in dependence on the thickness and hardness of the strip, this signal being used to control the rolling mill. The apparatus comprises two measuring heads which bear on the two sides of the strip with pressures sufficient to deform the material of the strip.

3,665,744

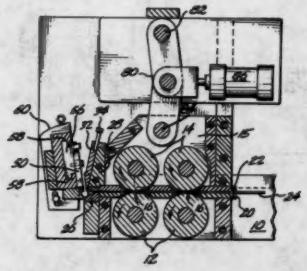
METHOD AND APPARATUS FOR MAKING SLEEVES

Clair M. Harter, 6406 South 143rd Street, Tukwila, Wash.

Filed May 21, 1970, Ser. No. 39,367

Int. Cl. B21f *11/00*

U.S. Cl. 72—129 **6 Claims**



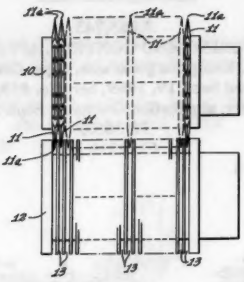
A method and apparatus is disclosed for the formation and production of circumferentially discontinuous thin-wall sleeves from a thin metallic strip.

3,665,745

PERFORATING APPARATUS AND PRODUCT

Walter R. H. Bion, Reading, England, assignor to Robert Bion and Company Limited, Reading, England

Filed May 4, 1970, Ser. No. 34,353
Int. Cl. B21d *28/12*
U.S. Cl. 72—186 **2 Claims**



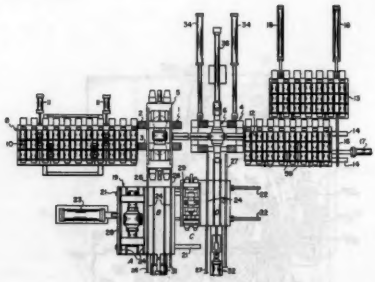
Improved apparatus for perforating strip or sheet material is provided at high perforating speeds and with an economy of material; and which may be used for the inexpensive production of perforated soft ductile metal strips for grills, acoustic devices, and the like, for example, to cover the openings of cabinets of radio receivers and other apparatus, as well as for use in filter tubes, acoustic strip ceilings, or other structural applications. The apparatus comprises a driven roller and a freely rotatable roller positioned so that a strip of soft ductile metal, such as aluminum, may be drawn between the roller surfaces as the driven roller is rotated. The driven roller is provided with rows of teeth, and the free roller has corresponding peripheral grooves, the combination being such that when the strip is fed between the rollers, the teeth of the driven roller penetrate the strip and form horizontal and longitudinal rows of slots, shallow elongated V-shaped depressions.

3,665,746

COMBINATION ROLLING MILL

Werner W. Elbe, McCandless Township, Allegheny County, Pa., assignor to Blaw-Knox Company

Filed Mar. 2, 1970, Ser. No. 15,326
Int. Cl. B21b *31/08*
U.S. Cl. 72—239 **16 Claims**



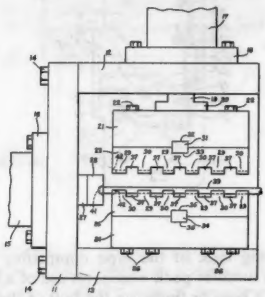
A cartridge loadable combination mill for rolling beam, structural or plate products. The combination mill includes a pair of cartridge or cartridge-like loaded mill stands, the first of which has a movable mill housing and the second of which is adaptable to being moved out of the mill line. The cartridges contain a pair of horizontal and vertical rolls that are aligned and adjusted prior to insertion into the mill stands through the mill housing windows. A four station cartridge transfer means having alternative stations simultaneously alignable with both mill stand windows is provided for supporting, positioning, and transferring work roll cartridges to the mill stands for insertion therein. A pair of movable table rolls with side guards adjustable to the maximum width of the first mill stand are movable either along the mill line or out of said line.

3,665,747

GRIPPING JAWS FOR COLD HEADING MACHINE

William Clyde Bickley, Corpus Christi, Tex., assignor to The Prescon Corporation

Filed May 4, 1970, Ser. No. 34,304
Int. Cl. B21d *11/04*
U.S. Cl. 72—304 **3 Claims**



Gripping jaws in a machine for cold heading high tensile strength steel wire that is greasy, in which the gripping jaws have a plurality of projecting wire gripping portions arranged to engage the wire at spaced intervals along its length and are grooved to receive the wire, the one gripping jaw being stationary and the other being movable toward the stationary one by means of a hydraulic cylinder. The projecting gripping portions project so that longer and shorter gripping portions alternate along the length of the wire and the longer gripping portions on the one jaw are opposite the shorter gripping portions of the other jaw so as to slightly deflect the wire gripped by the jaws first in one direction and then in the opposite direction so as to cause a waviness or undulation in the wire when it is gripped, which is so slight that the wire is not permanently deformed. This prevents any slippage of the wire when the heading die is forming a button head on the wire, the heading movement of the die being endwise of the wire toward the gripping jaws. To grip a wire, approximately one-quarter inch in diameter, the variation in the projection of the gripping portions of the jaws is preferably only 0.005 inch.

3,665,748

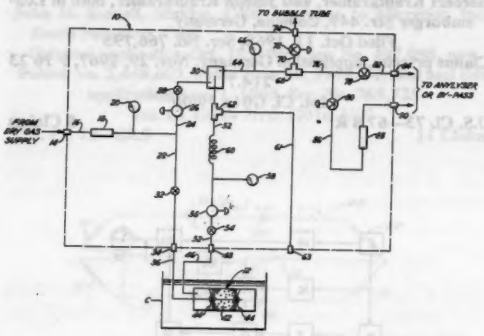
PORTABLE TRACE MOISTURE GENERATOR FOR CALIBRATION OF MOISTURE ANALYZERS

Richard T. Mator, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 2, 1970, Ser. No. 51,856
Int. Cl. G01m *19/00*
U.S. Cl. 73—1 A **35 Claims**

An improved calibrator for moisture analyzers is provided. A flow of clean dry carrier gas into two streams, one of which passes through an improved saturator bomb, wherein it is completely saturated with water, and then this saturated stream is mixed with the other dry stream to provide a controlled wet stream for calibration. A capillary restrictor is used to control one of the streams. The invention utilizes a

simple mathematical relationship for water concentration, means to vary each of the parameters in the relationship independently of the others, and means to simply determine values for the parameters, whichever are varied during a calibration.

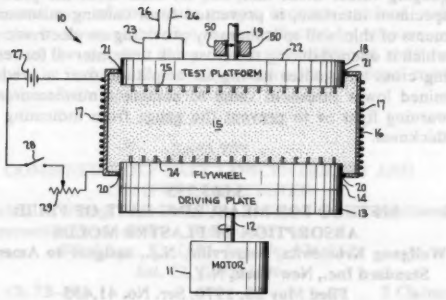


3,665,749

SHOCK MACHINE

Morris Brenner, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army

Filed July 27, 1970, Ser. No. 58,440
Int. Cl. G01n *3/08*
U.S. Cl. 73—12 **6 Claims**



A shock machine using a variable viscosity medium. A magnetic fluid shock tester enables the application of programmed shock pulses without the use of an impact medium. A fluid, whose viscosity can be readily varied in a predetermined manner, is provided with a driving force to set the fluid into motion and this motion in turn is imparted to a test platform which contains the test object. Any sudden change in the viscosity of the fluid is transferred directly to the test item, thereby imparting the desired shock signature to the item. The effect of the shock on the item is then measured electronically or visually as desired.

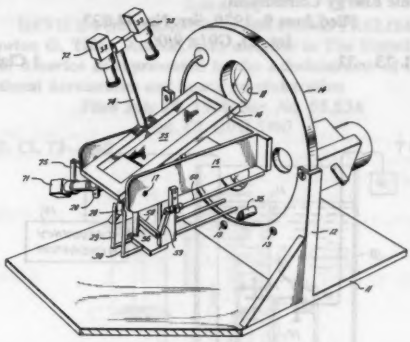
3,665,750

BURN RATE TESTING APPARATUS

Frederick S. Dawn, Houston, and William L. Gill, Seabrook, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 28, 1969, Ser. No. 853,641
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 R **11 Claims**

An apparatus for testing the burn rate between two spaced apart points on a sample of material. It includes an angularly adjustable support holder, an electrically ignited torch supplied with an independent supply of oxygen, a flame shutter between the torch and the sample holder and photocells positioned to sense ignition of the test material and the rate of burn between two spaced apart points on the material.

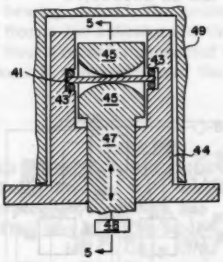


3,665,751

LOW-CYCLE FATIGUE TESTING MACHINE

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Christos Demogenes, 16050 Temecula Street, Pacific Palisades, Calif., and Connie E. Richard, 228 Stepney Street, Apt. 2, Inglewood, Calif.

Filed Aug. 4, 1970, Ser. No. 60,881
Int. Cl. G01n *3/20*, *3/32*
U.S. Cl. 73—15.6 **8 Claims**

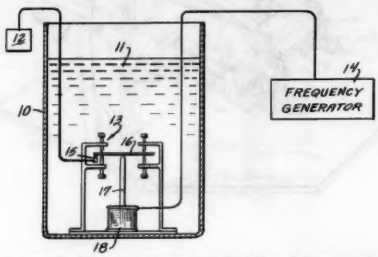


A low-cycle, fatigue tester which simulates cyclic thermal loading by the application of cyclic mechanical stresses and deformations. The specimen is heated to the critical (most conducive to failure) temperature of the structure under consideration, and then deformed cyclically by the two interconnected, opposing, convex jaws of a mandrel driven reciprocally by an oscillating ram. The cyclic wrapping of the specimen around the opposing jaws of the mandrel mechanically induces alternating compression and tension stresses in the surface of the specimen which simulate the thermal stresses that would be caused by a temperature gradient through the depth of the structure under consideration. The stress level is controlled by the radius of the mandrel. The frequency of the oscillation is representative of the frequency of the thermal cycle affecting the structure under consideration.

3,665,752
VIBRATION DENSITY METER COMPRISING NODAL CIRCLE SUPPORTED RESONANT DISK

Thomas C. Piper, Idaho Falls, Idaho, assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed June 9, 1970, Ser. No. 44,833
Int. Cl. G01n 9/00
U.S. Cl. 73—32 1 Claim

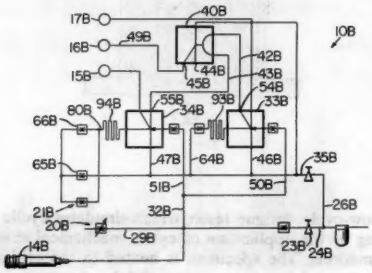


A disk supported only at the nodal circle of its simplest mode of vibration is driven at a resonant frequency by a magnetic force. The disk may be placed in a fluid and the density of the fluid can be determined by measuring the resonant frequency of the disk.

3,665,753
FLUID-OPERATED GAGE

John H. Walker, Ketering, Ohio, assignor to The Bendix Corporation

Continuation-in-part of application Ser. No. 793,270, Jan. 23, 1969, now Patent No. 3,577,766. This application Oct. 28, 1970, Ser. No. 84,834
Int. Cl. G01b 13/10
U.S. Cl. 73—37.9 22 Claims

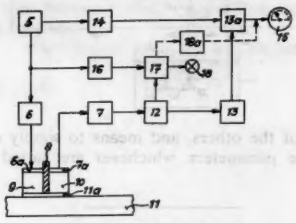


A fluid-operated gage is provided for determining acceptability of workpieces and such gage uses a pair of classifying devices to classify gaging signals into an acceptable range and indicators operatively connected to the classifying devices to indicate the character of each workpiece being checked. Limit control means is provided causing each classifying device to provide an oscillating signal to its associated indicator within a predetermined band once its limit is reached to enable precise setting of each classifying device.

3,665,754
APPARATUS TO PREVENT MISMEASURING OF WALL THICKNESS GAUGING BY ULTRASOUND

Herbert Krautkramer, and Joseph Krautkramer, both of Luxemburger Str. 449, Cologne, Germany

Filed Oct. 11, 1968, Ser. No. 766,795
Claims priority, application Germany, Nov. 29, 1967, P 16 23 214.7
Int. Cl. G01n 29/00
U.S. Cl. 73—67.8 R 5 Claims

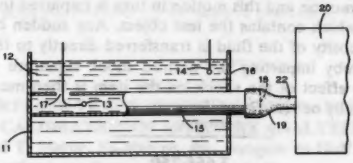


Method and apparatus are disclosed for preventing mismeasurement when gauging wall thickness by an ultrasonic pulse echo transit time method using separate transmitter and receiver probes. The pulse transit time, in the specimen plus a fixed known period of time is taken as the gauging value. Cross talk, i.e., an echo from the probe-to-specimen interface, is prevented from causing mismeasurements of thin wall specimens by providing an electronic gate which is opened during the cross talk time interval for receiving cross talk pulses having an amplitude over a predetermined lower threshold value to actuate a mismeasurement warning light or to prevent the gauge from indicating wall thickness.

3,665,755
METHOD FOR MEASURING RATE OF FLUID ABSORPTION OF PLASTER MOLDS

Wolfgang Krostewitz, Somerville, N.J., assignor to American Standard Inc., New York, N.Y.

Filed May 28, 1970, Ser. No. 41,435
Int. Cl. G01f 1/00
U.S. Cl. 73—73 10 Claims

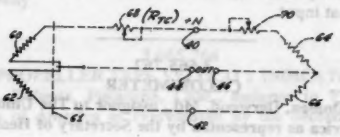


A solid state device for measuring the water absorption ability of a plaster mold includes a water reservoir, a capillary member and a pair of thermistors, one of which is designed to measure temperature changes in response to water flow in the capillary member during the measuring process.

3,665,756
STRAIN GAUGE TEMPERATURE COMPENSATION SYSTEM

John D. Russell, Malibu, Calif., assignor to Microdot, Inc., South Pasadena, Calif.

Original application Oct. 18, 1965, Ser. No. 497,098, now Patent No. 3,448,607, dated June 10, 1969. Divided and this application Aug. 1, 1968, Ser. No. 765,725
Int. Cl. G01b 7/16; G01n 3/00
U.S. Cl. 73—88.5 11 Claims



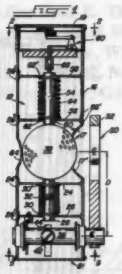
This invention relates to a system for measuring strains in a member and providing an indication of such strains. The system includes at least one strain gauge connected in a bridge with other resistance members, preferably strain gauges, to compensate for temperature changes. The bridge is provided with characteristics to maintain a constant current from a source of constant voltage even when the member is subjected to a variable strain. The output voltage from the bridge provides an indication of such variations in strain.

Preferably the resistors in the bridge constitute strain gauges which are connected to the member so that some of the strain gauges become stressed and others become strained when the member is stressed or strained. In one embodiment, one of the strain gauges becomes strained with changes in temperature but is not affected by stresses or strains in the member being measured. Additional resistors may also be included in the bridge to provide additional compensations for temperature changes.

3,665,757
COMBINED GOLF BALL CONCENTRICITY AND COMPRESSION TESTER

Charles R. Hoag, Glenview, Ill., assignor to International Recreation Products Inc., Skokie, Ill.

Filed Apr. 23, 1971, Ser. No. 136,713
Int. Cl. G01n 3/14
U.S. Cl. 73—94 3 Claims

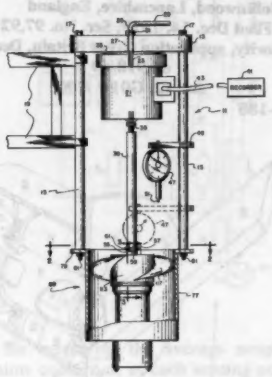


A gauge of lightweight tubular construction for checking the concentricity of a golf ball and the compression of the same having a lever for moving a first anvil a given distance against the ball, the ball moving against a second anvil registering the ball compression against a helical spring on a dial gauge, the handle of said lever being apertured as a go-no-go ring gauge for passage of the ball therethrough as a check on ball concentricity, combined with the direct insertion of the ball therefrom into position between the anvils of the ball compression test device in preparation for a check on ball compression.

3,665,758
DEVICE FOR MEASURING BEARING PRELOAD

Newton G. Tiller, Athens, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 16, 1970, Ser. No. 55,534
Int. Cl. G01l 5/00
U.S. Cl. 73—140 7 Claims

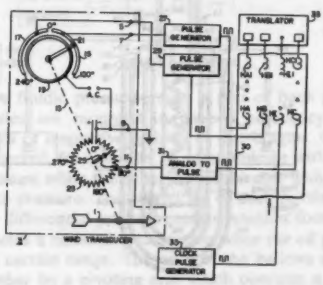


A device for measuring the thrust preload applied by spring washers against bearings mounted on the rotatable armature shaft of a high-speed motor. The assembly containing the motor is a ventilation fan assembly rigidly mounted on a frame opposite a load cell. The exposed end of the rotatable shaft is aligned with and coupled to a rod extending to the load cell. The load cell is forced away from the fan assembly enough to slightly displace the rotatable shaft axially and thereby apply additional pressure against the spring washer exerting the bearing preload. The amount of shaft displacement is read from a dial indicator and the load applied to the shaft is read from a recorder connected to the load cell. The bearing preload is computed from the force-displacement quantities.

3,665,759
WIND DIRECTION RECORDING SYSTEM

Thomas J. Daley, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 27, 1970, Ser. No. 40,831
Int. Cl. G01p 13/02
U.S. Cl. 73—188 7 Claims



A signal is developed that is proportional to the position of a wind-direction vane. The positions which may be occupied

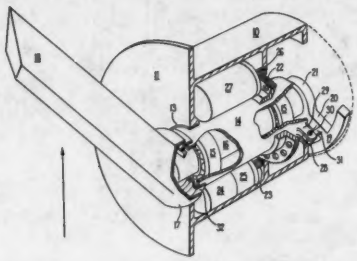
by the vane are divided into a plurality of sectors. Each of the sectors develops a signal when the vane is located in such sector. A time-interval signal also is generated at regular intervals. Each signal is recorded in a separate track of a recording medium such as magnetic tape. From these recorded signals the average wind direction during a time interval may be calculated.

3,665,760

AIRFLOW DIRECTION INDICATORS

Brian Edward Pitches, Balerno, and Robert Malcolm Stuart Murray, Edinburgh, both of Scotland, assignors to Ferranti, Limited, Hollinwood, Lancashire, England

Filed Dec. 14, 1970, Ser. No. 97,927
Claims priority, application Great Britain, Dec. 15, 1969, 60,918/69
Int. Cl. G01w *1/00*
U.S. Cl. 73—188 4 Claims



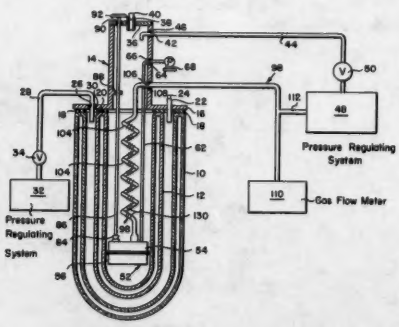
An airflow direction indicator has a hollow shaft mounted for sealed rotation into an enclosure and supporting an inner shaft carrying a vane which is located in the airstream. A seal is provided between the inner shaft and the hollow shaft which allows their relative rotation through a limited angle. A servo system is provided which operates to maintain the hollow shaft and the inner shaft within the limited angle relative to one another, and output means indicate the angular position of the hollow shaft relative to a datum position.

3,665,761

LIQUID VAPORIZATION CALORIMETER

William D. Gregory, Vienna, Va., assignor to Georgetown University, Washington, D.C.

Filed June 8, 1967, Ser. No. 644,703
Int. Cl. G01n *1/00*
U.S. Cl. 73—190 17 Claims



A calorimeter assembly comprising Dewar flask means, a sealed vacuum container positioned in the bottom of the Dewar flask means and a sealed sample holding container positioned in the vacuum container provided with sump means and a gas removal tube connected to the sump means; the gas removal tube extending toward the top of the Dewar flask means and having a portion located outside of the vacuum container which portion includes spiral windings, and means for introducing fluids into the Dewar flask means and said sample container and means for regulating pressure in the Dewar flask means and for measuring gas flow from the sample container. The invention also includes the method of measuring heat loss by use of the calorimeter assembly set out in which the volume of gas emitted from the gas removal tube is compared with that volume of gas emitted for a known heat input.

3,665,762

CALORIMETER

Steve R. Domen, Derwood, Md., assignor to The United States of America as represented by the Secretary of Health, Education and Welfare

Filed Nov. 4, 1969, Ser. No. 873,924
Int. Cl. G01k *17/00*
U.S. Cl. 73—190 R 10 Claims

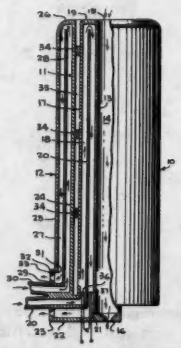
A heat loss compensated calorimeter wherein a core is surrounded by a jacket and the jacket is surrounded by a constant temperature, adiabatic or floating shield. The core and jacket have the same heat capacities, and thermistors having the same temperature coefficients are embedded in the core and jacket to compare the heat present, by means of a Wheatstone Bridge.

3,665,763

PROBE FOR DIAGNOSING HIGH TEMPERATURE GASES

Jerry Grey, 359 West 21st Street, New York, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,247
Int. Cl. G01k *3/08, 13/02*
U.S. Cl. 73—190 R 13 Claims



A probe for diagnosing the properties of a high temperature gas including a body having a first fluid passageway for receiving an aspirated gas sample therethrough, a second fluid passageway for circulating a coolant therethrough in

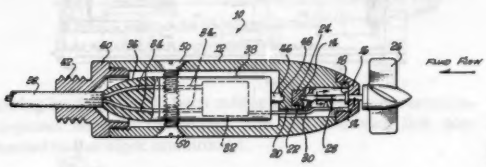
heat transfer relation with the gas sample flowing through the first fluid passageway, and a third fluid passageway disposed between the second fluid passageway and the environment of the body for circulating a coolant therethrough, the coolant in the third fluid passageway thermally insulating coolant flowing in the second fluid passageway from the environment of the body. The passageways for the aspirated gas sample and the coolants are provided with orifices to provide a fixed flow rate ratio in the passageways, and a thermocouple is disposed in the second fluid passageway for measuring the temperature rise of the coolant flowing in heat transfer relation with the aspirated gas sample in the first fluid passageway.

3,665,764

PROPELLER TYPE VELOCITY INDICATOR

Paul C. Roberts, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 16, 1970, Ser. No. 89,963
Int. Cl. G01f 1/10
U.S. Cl. 73—231 **5 Claims**



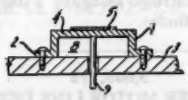
A propeller type velocity indicator including a casing; a propeller shaft rotatably mounted through the casing with a portion of the shaft extending within the interior of the casing and a portion extending exterior of the casing; a propeller mounted on the exterior portion of the shaft; the interior portion of the propeller shaft having an irregularity; a needle mounted within the casing so as to engage the shaft and sense the irregularity thereof; and pickup means mounted within the casing and connected to the needle for converting vibrations of the needle into electrical signals.

3,665,765

BI-MATERIAL CONDITION SENSING MEANS

Victor J. Dube, West Allis; Paul E. Thoma, Milwaukee, and Jao Shiun Kao, Wauwatosa, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Apr. 11, 1968, Ser. No. 720,684
Int. Cl. G01m 19/10; G01k 5/62
U.S. Cl. 73—337 **23 Claims**



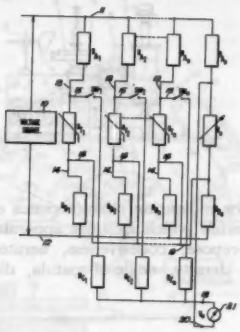
A bi-material temperature and/or humidity sensor including a circular disc which is mounted in fixed relation about the periphery. A flexible metal base member has a second material bonded to the center or to the outer portion to form a bi-material element. The second material is made of a substantially smaller area.

3,665,766

TEMPERATURE MEASURING APPARATUS

James Stewart Johnston, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, Bognor Regis, England

Filed Oct. 27, 1969, Ser. No. 869,585
Claims priority, application Great Britain, Oct. 28, 1968, 50,985/68
Int. Cl. G01k 3/06
U.S. Cl. 73—342 **15 Claims**



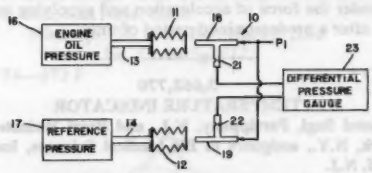
Apparatus for measuring the average temperature at a number of points comprises, at each sensing point, four terminal temperature responsive resistance elements. The current terminals of all the elements are connected in parallel constant current feed circuits. The voltage terminals of each element are connected, via a separate high impedance and switch for each element, to a voltage averaging circuit including datum voltage balancing means.

3,665,767

FLUIDIC PRESSURE INDICATOR

Horace B. Welk, Jr., Churchville, Pa., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 27, 1971, Ser. No. 110,202
Int. Cl. G01l 13/02
U.S. Cl. 73—407 R **8 Claims**



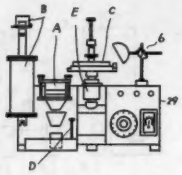
To form a fluidic pressure gauge a pair of back pressure sensor nozzles are mounted in gapped adjacency to the movable ends of respective bellows or diaphragms. One bellows is connected, for example, to communicate with the engine oil pressure while the other communicates with a suitable reference pressure. The output leg of each nozzle is connected to a differential pressure gauge. Another form of the invention yields a nonanalog indication when the oil pressure is outside a certain range. The ends of the bellows are connected together by a pivoting arm which operates a linearly movable slotted bar. An interruptable jet is mounted adjacent the slotted bar and connected to a fluidic logic gate whose outputs operate pneumatic indicators.

3,665,768

DEVICE OF MEASURING FLUID CHARACTERISTIC OF POWDERED OR GRANULAR MATERIALS

Masuo Hosokawa; Tohei Yokoyama, and Kiyoshi Urayama, all of Osaka, Japan, assignors to Kabushiki Kaisha Hosokawa Funtaikogaku Kenkyusho, Osaka, Japan

Filed Nov. 10, 1970, Ser. No. 88,460
Int. Cl. G01n *33/00*
U.S. Cl. 73—432 R 1 Claim



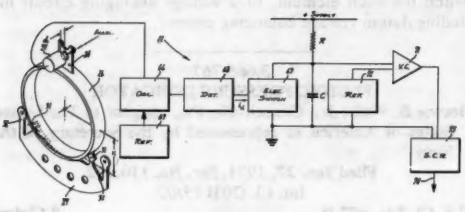
A device for measuring characteristics of powdered and granular materials which includes apparatus for measuring the angle-of-repose, cohesiveness, aerated bulk density, packed bulk density, angle-of-spatula, dispersability, and angle-of-fall.

3,665,769

ACCELERATION SWITCH

Harold D. Morris, Orinda, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed May 17, 1968, Ser. No. 730,125
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 18 Claims



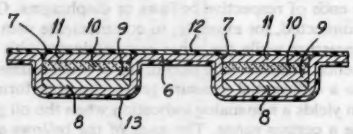
Acceleration switch having a mass and means for sensing when the position of the mass is shifted from a normal position under the force of acceleration and supplying an output signal after a predetermined period of time.

3,665,770

TEMPERATURE INDICATOR

Zsigmond Sagi, Parsippany, N.J., and Berel Weinstein, New York, N.Y., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed July 24, 1970, Ser. No. 58,001
Int. Cl. G01k *11/08, 11/16*
U.S. Cl. 73—356 16 Claims



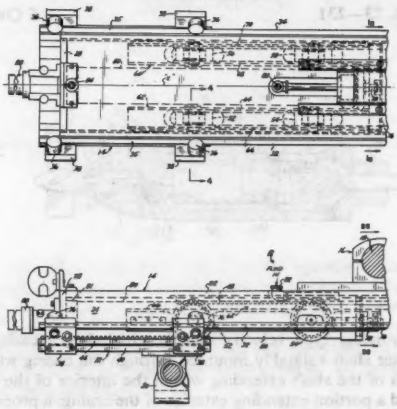
A thermometer is provided comprising a heat conductive carrier on which there are one or more temperature sensitive regions comprising temperature responsive substances having preselected and relatively precise points at which a temperature induced change in state will begin to occur. In multiple region systems, the regions are spaced apart and the substances are successively graduated with respect to the points. Included is a coloration or other indicator means and a material so positioned with respect to the temperature responsive substance and the indicator means as to be capable of incorporating or otherwise demonstrably responding to the indicator means as a result of the initiation of a temperature responsive change in the temperature responsive substance.

3,665,771

STROKE MULTIPLYING RETRACTOR MECHANISM

Leland F. Blatt, 24121 Mound Road, Warren, Mich.

Filed June 25, 1970, Ser. No. 49,862
Int. Cl. F16h *19/04*
U.S. Cl. 74—29 5 Claims



A retractor mechanism for an article handling or transfer apparatus is comprised of a stationary, longitudinal frame member, which slidingly supports a longitudinally movable carriage assembly, which normally carries the article handling implement. The carriage assembly is supported on spaced, parallel slideways and is moved by a gear and rack mechanism composed of a fixed rack attached to the stationary frame and a movable rack attached to and moving with the carriage assembly which are interconnected by at least one pinion gear. The pinion gear is supported in a carrier, which is connected to the piston rod of a fluid cylinder which provides a power actuation for longitudinal movement of the pinion carrier to drive the carriage assembly. The carriage driving rack and pinion mechanism, between the carriage and the supporting frame, is such that the piston stroke of the fluid cylinder acting on the pinion carrier to reciprocate the pinion carrier will be multiplied at least two times to move the carriage assembly a distance double the stroke of the fluid cylinder.

3,665,772

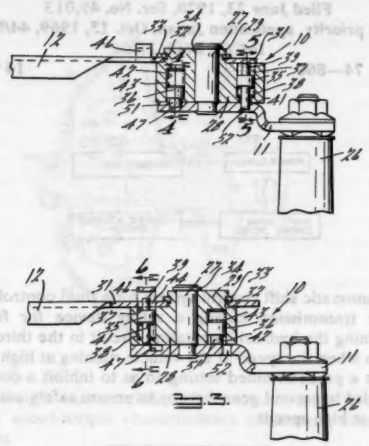
WINDSHIELD WIPER MOTOR LINK DEPRESSED PARK MECHANISM

Kenneth A. Beard, Ann Arbor; Theodore W. Daykin, Dearborn, and Gordon H. Jagger, Highland Park, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 11, 1970, Ser. No. 71,532
Int. Cl. F16h *21/40*
U.S. Cl. 74—75 4 Claims

A windshield wiper drive mechanism that functions to park the windshield wiper arms and blades outside the normal run

pattern, i.e., in a depressed park position, by extending the effective wiper motor output arm radius. The effective output arm radius is controlled through a rotation sensitive,



spring-loaded, double latch means carried on an eccentric interposed between the output arm and a driving link connected to the wiper arm linkage.

3,665,773

TRANSMISSION MEANS SUCH AS SPINDLE TAPES

Thomas Mitchell, Manchester, England, and Frederick Grossman, deceased, late of Manchester, England (by Doris Hindes, administrator), assignors to William Kenyon & Sons Limited

Continuation-in-part of application Ser. No. 447,943, Apr. 12, 1965, now abandoned , Continuation-in-part of application Ser. No. 561,287, June 28, 1966, now abandoned. This application Aug. 13, 1968, Ser. No. 753,846

Claims priority, application Great Britain, Jan. 6, 1968, 935/68

Int. Cl. B32b *27/08, 27/34*

U.S. Cl. 74—231 R **9 Claims**

A transmission tape comprising a woven fabric the constituent yarns of which are selected from the group consisting of natural cellulose and nylon and mixtures of polyethylene terephthalate and cotton have been impregnated with an alkyl acrylate polymer and nylon of low melting point.

3,665,774

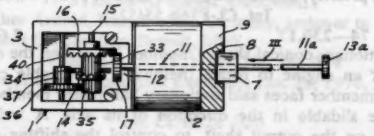
DRIVING ASSEMBLY

Gunter Bauhus, and Hans Schmidtchen, both of Nurnberg, Germany, assignors to Gebr. Buhter Nachfolger GmbH, Nurnberg, Germany

Filed Dec. 30, 1969, Ser. No. 889,283

Int. Cl. F16h *3/02, 1/20, 1/12*

U.S. Cl. 74—325 **11 Claims**



A driving assembly has a gearing and a motor the drive shaft of which can be selectively coupled with one of two or more input gears of the gearing thereby changing the ratio of transmission of the gearing. The motor is exchangeably mounted and may have two drive gears either one of which can be coupled to an input gear of the gearing.

3,665,775

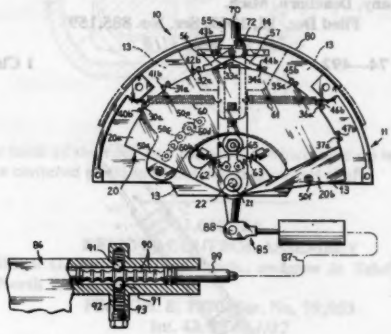
RATCHET CONTROL MECHANISM

Kenneth G. Freeman, 2047 Bel Air Avenue, San Jose, Calif.

Filed Oct. 6, 1970, Ser. No. 78,393

Int. Cl. G05g *9/00*

U.S. Cl. 74—473 R **13 Claims**



A ratchet control mechanism in which a series of ratchet teeth are formed on the arcuate wall of a plate. The ratchet plate is mounted for rotary movement about an axis thereof. A handle with a pawl is mounted for movement about a pivot point spaced from the axis of the ratchet plate. The handle is spring loaded for return to its central position after each actuation thereof. The pawl engages, respectively and successively, the ratchet teeth to rotate the ratchet plate in one direction in a step-by-step incremental rotary movement in response to the actuation of the handle in one direction from the central position thereof and to rotate the ratchet plate in another direction in a step-by-step incremental rotary movement in response to the actuation of the handle in another direction from the central position thereof.

3,665,776

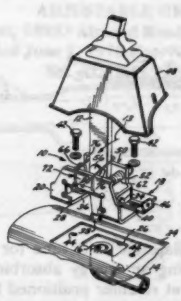
VEHICLE GEAR SHIFT MECHANISM

Stanley C. Hess, Temple City, Calif., assignor to Superior Industries, Inc., Van Nuys, Calif.

Filed Apr. 26, 1971, Ser. No. 137,210

Int. Cl. G05g *9/12*

U.S. Cl. 74—473 P **2 Claims**



A vehicle gear shift mechanism of the type in which a gearshift stick is carried by mounting brackets for pivotal

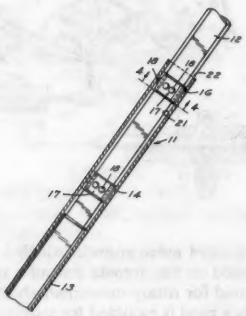
movement about both longitudinal and transverse axes, and in which the stick is preloaded or biased away from a generally upright position. An installation clip is provided to resist such bias and maintain the stick in the upright position necessary on installation to align the linkage ball of the stick with the shifting socket of the vehicle transmission gear actuating linkage. The clip is readily removable once installation of the shift mechanism is completed.

3,665,777

ENERGY ABSORBING STEERING COLUMN

Finn Benzon Jensen, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 15, 1969, Ser. No. 885,159
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **1 Claim**



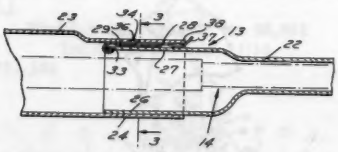
A steering column assembly including an energy absorbing outer jacket and a telescopically collapsible steering shaft. The shaft has a resilient friction member separating the inner and outer shaft components. The friction member is radially compressed between the two components to maintain the relative axial position of the shaft components and to prevent audible vibration between the components.

3,665,778

ENERGY ABSORBING STEERING COLUMN

William J. Bohan, Plymouth, and Hani N. Sarafa, Oak Park, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 2, 1970, Ser. No. 68,838
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **7 Claims**



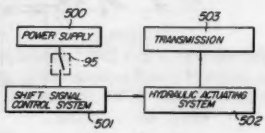
A telescopically collapsible shift tube for use in steering column assembly having an energy absorbing outer jacket. The tube has a resilient retainer positioned between adjoining portions of the inner and outer tube elements. The retainer is radially compressed between the two tube elements to maintain the relative axial position of the elements and to prevent audible vibrations between the elements.

3,665,779

AUTOMATIC SHIFT CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Takakazu Mori, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed June 23, 1970, Ser. No. 49,013
Claims priority, application Japan, Oct. 13, 1969, 44/81677
Int. Cl. B60k *21/00*
U.S. Cl. 74—866 **14 Claims**



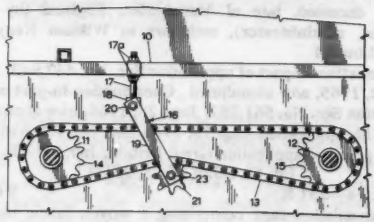
An automatic shift control system for a fluid controlled automatic transmission having a safety device for forcedly maintaining the hydraulic actuating circuit in the third speed position when the speed of the vehicle running at high speeds exceeds a predetermined setting so as to inhibit a downshift from third to second gear thereby to ensure safety and stable driving at high speeds.

3,665,780

TENSIONING ASSEMBLIES FOR DRIVE CHAINS

John T. Lunenschloss, c/o Air-Lec Industries, Inc., 3300 Commercial Avenue, Madison, Wis.

Filed Oct. 9, 1970, Ser. No. 79,461
Int. Cl. F16h *7/08, 7/12*
U.S. Cl. 74—242.9 **2 Claims**



An idler sprocket assembly for keeping tension on the drive chain of a drive assembly. The device has a stationary but adjustable mounting bracket positioned between a drive shaft and a driven shaft. The drive chain runs over an idler sprocket carried on the end of a pivotally mounted swing arm for maintaining tension on the chain.

3,665,781

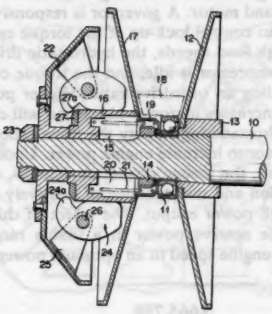
SHEAVE DRIVE TYPE AUTOMATIC TRANSMISSION DEVICE

Katsuhiko Kawamura, Hamakita, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Hamakita-shi, Japan

Filed Aug. 28, 1970, Ser. No. 67,692
Claims priority, application Japan, Sept. 1, 1969, 44/82452
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **7 Claims**

A stationary conical sheave member is fixed on the output shaft of an engine to rotate therewith. A movable conical sheave member faces said stationary half pulley member and is made slidable in the direction of its axis. A weight is pivoted on the output shaft, to control the shifting of the movable conical sheave member by a pawl portion; the contact plane of the movable conical sheave member along which the pawl portion of the weight slides has a convex cur-

vature in the direction in which the pawl portion of the weight slides along said contact plane, so as to vary the



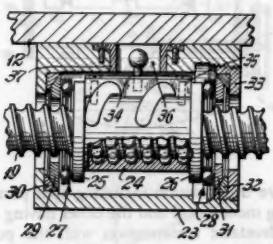
speed-torque characteristics of the sheave drive to match it to the speed-torque characteristics of internal combustion engines.

3,665,782

NUT SUPPORT TO ACCOMODATE MISALIGNMENT

Robert M. Loftus, Farmington, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Sept. 4, 1970, Ser. No. 69,792
Int. Cl. F16h *1/18, 55/22*
U.S. Cl. 74—424.8 R **8 Claims**



A support for containing a nut operating on a rotating threaded shaft where the nut is connected to a part mounted for linear movement essentially along the axis of the shaft and in which the support between the nut and the part accommodates misalignment between the shaft and the part without introducing dimensional error along the axis of the shaft.

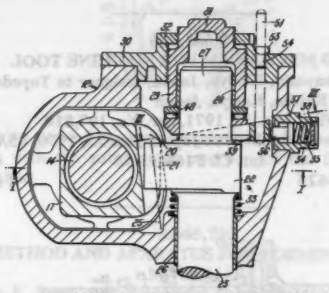
3,665,783

STEERING GEAR ASSEMBLY

Guenther Arnold, Russelsheim, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 18, 1971, Ser. No. 107,079
Claims priority, application Germany, Jan. 29, 1970, P 20 03 962.7
Int. Cl. B62d *1/20*
U.S. Cl. 74—498 **8 Claims**

A steering gear assembly for a motor vehicle has a toothed rack meshing with a sector on a steering output shaft. A wedge member is biased into engagement with the output shaft to displace it in a sense tending to take up play between



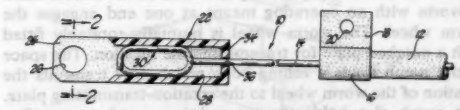
the teeth of the rack and the sector, which take up is greatest at a centered position of the steering output shaft.

3,665,784

REMOTE CONTROL ASSEMBLY

William G. Bennett, Troy, Mich., assignor to Teleflex, Inc., North Wales, Pa.

Filed Oct. 8, 1970, Ser. No. 79,053
Int. Cl. F16c *1/22*
U.S. Cl. 74—501 **17 Claims**



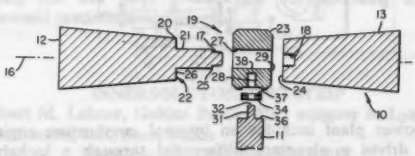
A motion transmitting remote control assembly including a conduit and a motion transmitting core element movably supported by the conduit. A terminal means is attached to one end of the core element and is adapted for attachment to a member to be controlled and normally moves with the core element but may move relative to the core element longitudinally of the core element in response to a predetermined force to automatically adjust the effective length of the core element. In one embodiment the core element has loops therein in frictional engagement with an organic polymeric terminal means and in another embodiment the core element has ratchet teeth on the end thereof in engagement with ratcheting teeth on the terminal means.

3,665,785

TRANSMISSION SHIFT LEVER HANDLE WITH AN ADJUSTABLE GRIP

Stephen W. Moal, 18953 Almond Road, Castro Valley, Calif.

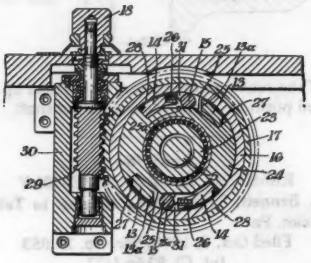
Filed June 1, 1970, Ser. No. 42,192
Int. Cl. G05g *1/10*
U.S. Cl. 74—543 **12 Claims**



A transmission shift lever handle has a cylindrical grip member defining a gripping surface about an axis. A coupling

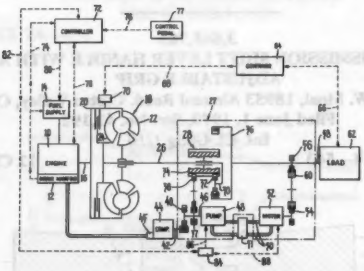
joins the grip member at its mid portion to a floor mounted shift lever of a transmission to form a T-joint. The grip member is joined to the lever by the coupling to revolve about its gripping axis while the lever is moved between various shift stations.

3,665,786
FEED MECHANISM FOR MACHINE TOOL
Akiyoshi Kobayashi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan
Filed Jan. 19, 1971, Ser. No. 107,814
Claims priority, application Japan, Jan. 22, 1970, 45/6735
Int. Cl. F16h *35/00*
U.S. Cl. 74—625 **4 Claims**



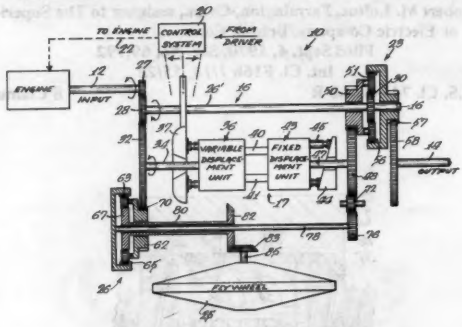
In the feed handle mechanism of a machine tool, a handle and a worm wheel are rotatably mounted on the handle shaft. A worm with an operating means at one end engages the worm wheel. The worm wheel is mutually rotatably fitted with a notched plate for transmitting the rotation. The space in the notch holds a rolling body which only transmits the rotation of the worm wheel to the rotation-transmitting plate. The notch also holds the transmitting member extending from the above mentioned handle and the transmitting member extending from the above mentioned handle shaft on both sides of the above mentioned rolling body.

3,665,787
POWER PLANT
William H. Wilkinson, Columbus, Ohio, assignor to Perkins Services N.V., Curacao, Netherlands Antilles
Filed July 24, 1970, Ser. No. 58,011
Int. Cl. F16h *37/06;* **B60k** *21/00*
U.S. Cl. 74—674 **27 Claims**



A power plant includes an internal combustion engine which drives a planetary differential through a lockable hydrostatic torque converter. One of the differential outputs drives a supercharging air compressor, while the other output drives the power plant load through a drive shaft. The two outputs are inter-connected by a variable displacement hydrostatic drive including a pump and a motor. Thus a split path drive through the hydrostatic leg and through the mechanical connection to the output is provided. A controller receives an engine speed signal, a manifold pressure signal and an engine speed setting and provides an output signal to control a variable fuel supply to the engine and another output signal for controlling adjustment of the hydrostatic pump and motor. A governor is responsive to the speed of the load to control lock-up of the torque converter. In operation at high load speeds, the hydrostatic drive leg is locked out, the compressor is idle, and the torque converter is locked up, yielding an overdrive ratio. Higher power demands caused by increases in power plant load will cause activation of the hydrostatic leg to vary the drive ratio and activate the compressor to increase engine power. Upon further increase of the load, the torque converter unlocks, enabling torque multiplication and maintenance of relatively high engine speed for high power output. The effect of this power plant is to provide reserve power in a usable range only, while maintaining engine speed in an optimum power range.

3,665,788
HYDROMECHANICAL STORING TRANSMISSION
Bengt E. Nyman, Rockford, Ill., assignor to Sundstrand Corporation
Filed Aug. 19, 1970, Ser. No. 65,199
Int. Cl. F16h *3/74, 47/04;* **G05g** *15/00*
U.S. Cl. 74—751 **10 Claims**

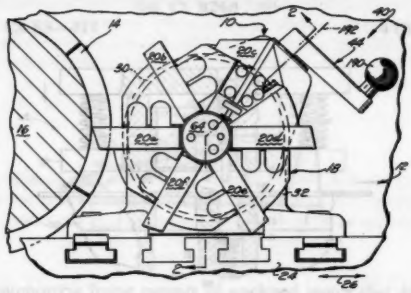


A regenerative transmission including split parallel power paths, one being mechanical and the other having an infinitely variable hydrostatic transmission with the power paths being combined by a differential at the transmission output that is constructed to produce a zero output when the hydrostatic drive rotates the differential elements in a subtracting or negative direction at a predetermined speed. The transmission input and the output from the hydrostatic drive are connected through a summing differential to drive a flywheel that stores energy under static conditions and regenerates energy by (1) providing assist torque to the output shaft during acceleration, and (2) absorbing energy normally delivered at the output shaft during deceleration to assist in transmission braking.

3,665,789
TURRET ASSEMBLY
John Fisher, Aurora, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Mar. 9, 1970, Ser. No. 17,822
Int. Cl. B23b *29/30*
U.S. Cl. 74—813 L **12 Claims**

An improved machine tool turret assembly includes a turret for holding a plurality of tools. During machining operations the turret is held against rotation by a coupling. Upon

operation of the coupling to a disengaged condition by an actuator assembly, a reversible drive assembly is operable to rotate the turret in a selected one of two directions to move a desired tool to an operating position. The coupling is then reengaged by operation of the actuator assembly. The actuator



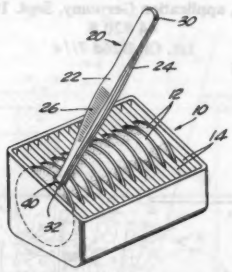
assembly includes a wedge member which is moved by a cam to effect operation of the coupling between the engaged and disengaged conditions. When the coupling is engaged, a spring applies a biasing force to the wedge member to thereby urge surfaces of the coupling together with a constant clamping force.

3,665,790

TWEEZERS

Price D. Jones, Manhattan Beach, Calif., assignor to Swiss American Precision Imports, Inc., El Segundo, Calif.

Filed July 20, 1970, Ser. No. 56,510
Int. Cl. B25b *9/02*
U.S. Cl. 81—43 2 Claims



The device is a tweezers or tool particularly constructed and adapted for picking up and handling thin fragile objects such as silicon wafers or the like. The noses or jaws of the tweezer parts or legs are particularly configurated for the purpose intended. The end parts or jaws of the tweezer legs are configurated to limit the inward movement of the wafer or other object between the jaws and also to limit the opening movement of the jaws. The invention embodies several different preferred configurations for accomplishing these purposes.

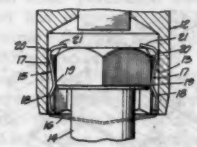
3,665,791

KEEPER FOR HEXAGONAL FASTENER WRENCHES

Harry A. Carr, 2934 El Caminito, La Crescenta, Calif.

Filed Jan. 21, 1971, Ser. No. 107,989
Int. Cl. B25b *13/58*
U.S. Cl. 81—125 12 Claims

A keeper accessory for use on a wrench head to hold a hexagonal fastener frictionally and firmly captive therein. The one piece accessory is particularly suitable for installation in any twelve point head without need for alterations or tools and fits a range of wrench head sizes by its inherent



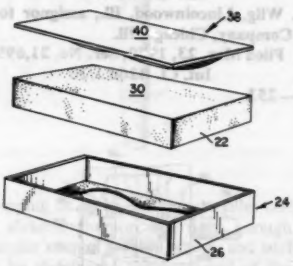
ability to expand against the interior surfaces without interfering with the subsequent insertion of the fastener to be wrenched.

3,665,792

METHOD AND APARATUS FOR FORMING FOAM MATERIAL

James S. Bush, 901 Longridge Road, Oakland, Calif., and Robert S. Mason, 522 Sheldon, El Segundo, Calif.

Filed Feb. 20, 1970, Ser. No. 13,137
Int. Cl. B26d *7/08*
U.S. Cl. 83—1 2 Claims



A method and apparatus for forming foam material, such as polyurethane or foam rubber, into any desired shape, including multi-curved objects, e.g. a contoured dress form. A mass of preformed foam material is forced through an opening having a peripheral configuration corresponding to that of the finished article. A die used to force the mass through the opening is of the general contour desired in the end article. After a portion of the original mass is forcibly urged through the opening, such extruded portion is sheared away from the remaining mass in the plane of the opening. After the shearing operation, the cut-away portion of the foam will assume the contours of the die, but in effect be a mirror image thereof.

In a second phase of the invention, the article produced in the manner above described is positioned over a die opening having a periphery smaller than the periphery of the article by some predetermined amount. The article is forced through such opening with a flat die which is caused to stop from the plane of the opening by the same amount. The extruded portion is again sheared away in the plane of the opening. After the shearing, the article remaining will have the same peripheral configuration and the same external contours, but will have a thickness corresponding to the aforesaid predetermined amount.

3,665,793

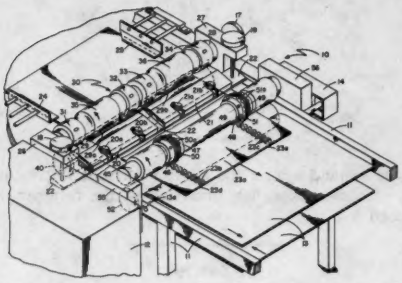
INNERSOLE FORMING STRIP

Robert M. Lehner, Golden Beach, Fla., assignor to Lyn-Flex Industries, Inc., Saco, Maine

Filed Jan. 23, 1970, Ser. No. 5,217
Int. Cl. B26d *9/00*
U.S. Cl. 83—2 4 Claims

An innersole forming strip from which innersoles can be prepared suitable for use in a wide variety of shoe styles and

sizes by transverse alternate direction die-cutting. The strip is



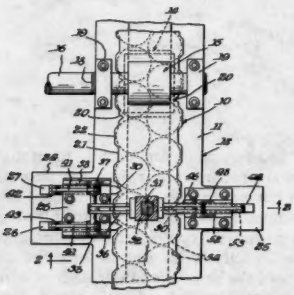
formed by skiving fiberboard on one surface with two bands spaced on either side of a non-thinned central band.

3,665,794

APPARATUS FOR POSITIONING SCROLL SHAPED METAL STRIPS

Chester M. Wiig, Lincolnwood, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Filed Mar. 23, 1970, Ser. No. 21,699
Int. Cl. B26d 5/20
U.S. Cl. 83—253 **1 Claim**



In the stamping of articles from scroll shaped strips, it is necessary that the strip be accurately positioned so as to precisely align the strip with respect to the stamping dies. The entire area of the articles must be stamped out of the material of the strip to insure its perfect shape. The invention contemplates novel and improved means for engaging the side edges of the scroll cut strip for the purpose of accurately positioning and aligning the strip with respect to the stamping dies. In one modification the side edges of the strip are provided with piloting notches.

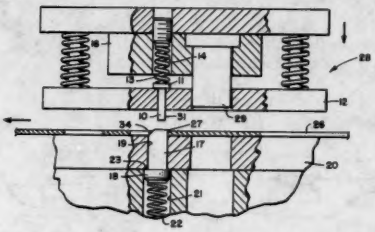
3,665,795

TWO STAGE WORKSTOCK LOCATOR FOR PUNCH PRESSES

William J. Mayer, Hoffman Estates, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 15, 1969, Ser. No. 885,156
Int. Cl. B26d 7/16
U.S. Cl. 83—395 **3 Claims**

Workstock to be operated upon by a punch press is advanced into blocking engagement with a first locating device which is slidably mounted in the die of the punch press and which locates the workstock in a first position. When the punch press is operated a second locating device, positioned in the ram of the punch press, engages the first locating device and forces it beneath the bottom surface of the advancing stock. When the first locating device is depressed beneath the bottom surface of the workstock, the workstock partially advances over the first locating device and into engagement with the second locating device, which accurately locates it in a second and final position to be operated upon by the punch press. The bottom surface of the workstock



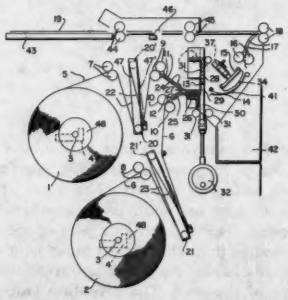
holds the first locating device out of blocking engagement with the workstock, and after the punching operation the workstock advances over the first locating device until the portion of the workstock which has just been blanked out by the punch is above the first locating device, at which time the first locating device rises to again block the advancing workstock and to initially locate it in the first position for the next punching operation.

3,665,796

APPARATUS FOR CUTTING A WEB OF MATERIAL

Horst Witte, Wiesbaden-Biebrich, Germany

Filed Oct. 22, 1970, Ser. No. 83,005
Claims priority, application Germany, Sept. 10, 1970, P 20 44 820.8
Int. Cl. B26d 7/14
U.S. Cl. 83—156 **4 Claims**



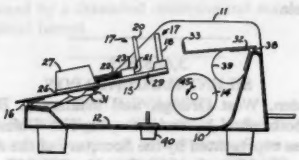
This invention relates to an improvement in an apparatus for cutting a web of material, the apparatus including supply means for the web of material, a first feeding means for feeding the web to a cutting means, a cutting means, and a second feeding means behind the cutting means, and the improvement comprising movable guide means for the web positioned between the cutting means and the second feeding means, said first feeding means being stationary and said second feeding means being in operation during a cutting operation.

3,665,797

RING CUTTING TOOL

George Henry Gilham, deceased, late of Hermiston, Oreg. (by Gay Maude Gilham, administratrix), and Wesley R. Door, Kennewick, Wash., assignors to USM Corporation, Boston, Mass.

Filed Aug. 24, 1970, Ser. No. 66,234
Int. Cl. B26d 7/06
U.S. Cl. 83—411 4 Claims



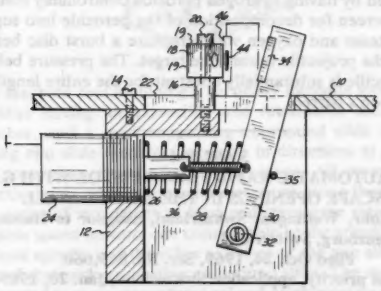
A supporting frame mounts an enclosed motor that drives a circular cutting disc. Mounted outward of the disc is a pivoted platform with a movable ring clamp indexed to facilitate the removal of a pre-selected section from a finger ring. Also provided is a pivotable shelf for facilitating the cutting of ring stock, ring sections and other jewelry details.

3,665,798

TAPE SEVERING DEVICE

Thomas J. Tapert, Birmingham, and James H. Current, Hazel Park, both of Mich., assignors to Apex Electrophysics, Inc., Troy, Mich.

Filed Nov. 2, 1970, Ser. No. 85,856
Int. Cl. B26d 5/08
U.S. Cl. 83—575 3 Claims



Tape cutting means comprising a stationary cutting edge and a movable anvil, particularly useful in severing sound recording and sound playback tape of the type commonly used in cassettes and cartridges, characterized by the fact that the cutting edge is one of 12 edges of a cube which may be mounted in one of several positions to present any one of its 12 edges to the anvil for tape severance.

3,665,799

ADJUSTABLE DRUM MALLETS

Fred D. Hinger, 357 Hilltop Avenue, Leonia, N.J.

Continuation of application Ser. No. 871,739, Sept. 11, 1969, now abandoned, which is a continuation of application Ser. No. 656,398, July 27, 1967. This application Nov. 23, 1970, Ser. No. 92,157
Int. Cl. G10d 3/16
U.S. Cl. 84—422 15 Claims

The drum mallets disclosed are adjustable, by the percussion player, as to weight and/or balance and/or head characteristics, so as to vary the "feel" of the mallet, and thus also the tonal effect obtainable when playing upon kettle-drums, snare-drums, and other percussion instruments; and, typically, the mallet has frictionally slidable, removable and replaceable, external balancing mass means, positionable to serve as the striking head of the mallet, whereby the adjustment as to balance, overall weight, head characteristics and tone production may be readily obtained. In some forms, the said mass means regularly serves as a removable and replaceable striking head; while in other forms, the mass means comprises one or more thin elongated tubes having a

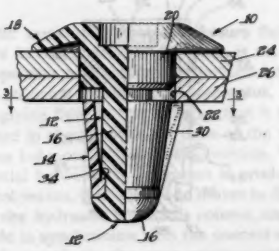
frictionally-gripping fit on an elongated mallet body, so as to be manually slidable thereon but tight enough to avoid dislodgment under normal playing action; and such a tubular member may be slidable to the head-end of the mallet to serve as a striking head or it may be slidable to a position to serve as a hand grip; and one or more such tubular members may be placed in various positions along the length of the mallet. The mallet body may also have a tapered element at the head-end to assure retention of mass members especially of enlarged-head types; and the disclosure further includes such heads embodying a relatively hard inner portion and a relatively soft outer covering.

3,665,800

SNAP-IN FASTENER AND APPARATUS FOR MOLDING SAME

Francis E. Ryder, Mt. Prospect, Ill., assignor to Value Engineered Components, Inc., Lake Zurich, Ill.

Filed Mar. 20, 1970, Ser. No. 21,444
Int. Cl. F16b 21/08
U.S. Cl. 85—5 8 Claims



The present invention relates generally to improvements in fasteners adapted for snap insertion within a work aperture,

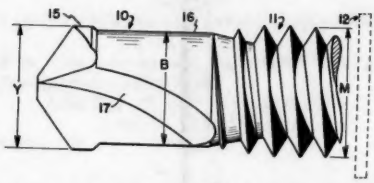
and more particularly to improvements in snap-fasteners of multi-piece form. The embodiment of the invention disclosed herein comprises a headed shank member and a sleeve member telescopically associated therewith. The sleeve member is secured in pre-determined spaced relation with respect to the work engaging side of the head and incorporates a laterally yieldable section to permit telescopic association thereof with a work aperture. The spacing of the sleeve with respect to the head is dependent upon a preselected lineal dimension of the shank, such dimension being determined by the thickness of the work to which the fastener is to be applied.

3,665,801

DRILL SCREW

Charles E. Gutshall, Ellwood City, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 25, 1970, Ser. No. 66,795
Int. Cl. F16b *25/00, 35/00*
U.S. Cl. 85—41 **5 Claims**



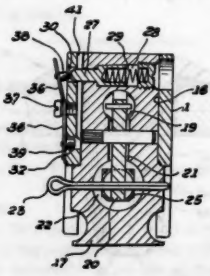
The drill screw comprises a drill tip, a threaded shank and a head. The drill tip is in two sections, the first of which is a pyramidal shaped entry section, and the second of which is a trailing section having a diameter less than the major diameter of the first section. The major diameter of the entry section is generally larger than or equal to the pitch diameter of the threaded section or where the major diameter of the entry section is smaller than the pitch diameter of the threads, a convolutely fluted section having a major diameter greater than the major diameter of the entry section but less than the major diameter of the threads is positioned adjacent the trailing section of the drill tip and intermediate the drill tip and the threads.

3,665,802

FIRING MECHANISM FOR EXPLOSIVELY ACTUATED TOOL

Robert Temple, Pittsburgh, Pa., assignor to Mine Safety Appliances Company

Filed Apr. 6, 1970, Ser. No. 25,643
Int. Cl. F41c *11/02*
U.S. Cl. 89—1 B **5 Claims**



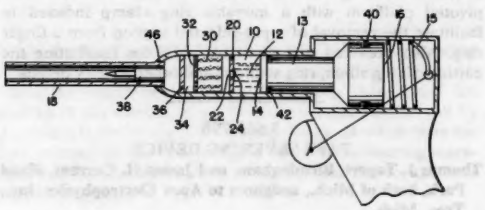
A breech block is mounted behind the breech in the frame of an explosively actuated tool and is movable transversely of the frame to an inoperative position exposing the rear end of the cartridge-receiving bore through the breech. A firing pin is supported by the block in line with the bore. Carried by the breech block for movement transversely thereof is a spring-pressed detent that normally projects into a hole in the frame beside the block to hold the block with its firing pin in operative position. The frame is provided with a second hole for receiving the detent when the block has been moved to its inoperative position. Manually operable means are mounted on the frame for pushing the detent out of either of the frame holes to permit it to be moved with the block to the other hole.

3,665,803

SILENT HAND WEAPON

Irving Forsten, West Orange, and William J. Buckley, Jr., Sparta, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 3, 1969, Ser. No. 881,805
Int. Cl. F41f *1/00*
U.S. Cl. 89—7 **7 Claims**



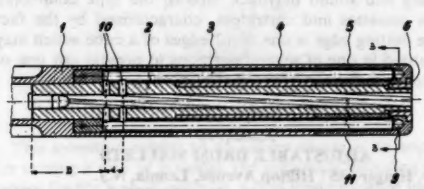
A hand held weapon having especial value in guerilla fighting and the like since the weapon is capable of discharging projectiles without visible or audible signals. The weapon is actuated by having hydrogen peroxide controllably contact a silver screen for decomposition of the peroxide into superheated steam and oxygen which rupture a burst disc before sending the projectile toward the target. The pressure behing the projectile is substantially constant for the entire length of the weapon's barrel.

3,665,804

SEMI-AUTOMATIC RAPID FIRING PISTOL WITH GAS ESCAPE OPENINGS IN THE BARREL WALL

Edwin Rohr, Wettingen, Switzerland, assignor to Hammerli AG, Lenzburg, Switzerland

Filed Oct. 24, 1969, Ser. No. 869,060
Claims priority, application Switzerland, Jan. 20, 1969, 1027/69
Int. Cl. F41c *21/18*
U.S. Cl. 89—14 C **3 Claims**



A semi-automatic pistol having gas escape ports in the sides of the barrel wall immediately forward of the cartridge chamber, which ports permit gas to escape from the firing chamber. From these ports, the gas is conducted along a pair of elongated gas transfer passageways extending parallel to and disposed on either side of the barrel of the pistol. At the

ends of the chambers opposite the aforementioned gas escape ports, and adjacent to the open end of the pistol barrel, these passageways terminate in gas exit ports open to the outside air, which ports extend upwardly and to either side at an acute angle to the vertical. The escape of gas from these ports by reaction tends to force the open end of the pistol barrel downwardly and thus counteracts the tendency of the barrel to move upwardly and to the left upon firing.

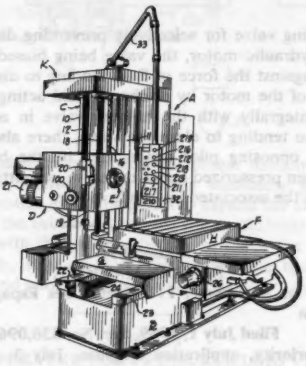
The tubular members forming the gas passageways are embedded in the pistol stock adjacent the firing chamber, and are retained therein by an annular jacket or cover which, in turn, is retained by a threaded retaining nut screwed into the end of the pistol barrel.

3,665,805

MACHINE TOOL

Heinz K. Wolf, Willoughby Hills, Ohio, assignor to The New Britain Machine Company, New Britain, Conn.

Filed Dec. 5, 1969, Ser. No. 882,502
Int. Cl. B23c *1/12*; B23p *39/14*
U.S. Cl. 90—14 **15 Claims**



A machine tool including a vertically movable spindlehead member having an extensible and retractable tool spindle member, and a work-supporting compound slide assembly having two slide members movable in directions at right angles to one another in horizontal planes. All members are selectively movable in opposite directions along their respective paths of movement at feed and transverse rates by two variable speed motors, one connectable to the spindlehead or the tool spindle and the other to either of the two slide members of the work-supporting compound slide. The motors are connected to their respective tool and work-moving members through discrete transmissions of the continuously meshed gear type under the control of hydraulically actuated clutches. Spindle feed is alternatively provided from a spindle drive motor to correlate feed with spindle rotation. Brake discs selectively deflectable against fixed abutments and connected to rotatable parts will maintain selected tool and work-carrying members in fixed positions.

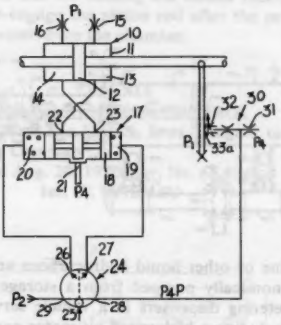
3,665,806

FLUID OPERATED SERVOMECHANISM

Ronald Alfred Heath, Harborne, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Sept. 17, 1969, Ser. No. 858,688
Claims priority, application Great Britain, Sept. 30, 1968, 46,267/68
Int. Cl. F15b *13/042*, *13/16*
U.S. Cl. 91—52 **9 Claims**

A servomechanism in which a double-acting fluid operated device, as for example a piston and cylinder unit, is controlled by a fluidic circuit via a relay valve. The circuit comprises a fixed and a variable flow restrictor in series, with variable restrictor being controlled by the position of the double-acting device. A pressure signal applied to one of the restrictors generates between the restrictors one control



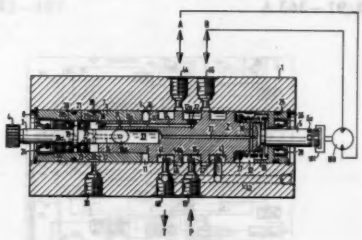
signal for a fluidic proportional amplifier. A second pressure signal forms the other control signal for the amplifier. Output signals from the amplifier serve to position the moving element of the relay valve and hence position the moving element of the double-acting device.

3,665,807

CONTROL VALVE ARRANGEMENT FOR A HYDRAULIC APPARATUS

Reiner Bartholomaus, Lohr am Main, and Holger Krohn, Wombach, both of Germany, assignors to Indramat-Gesellschaft Fuer Industrie-Rationalisierung und Automatisierung GmbH, Lohr am Main, Germany

Filed Aug. 10, 1970, Ser. No. 62,326
Int. Cl. F15b *21/02*
U.S. Cl. 91—35 **14 Claims**



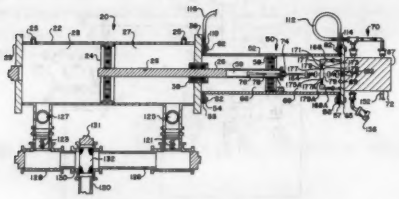
A hydraulic apparatus receives pressure fluid through a control valve having a valve slide which is rotatable by the hydraulic apparatus, and also axially movable between a closing position stopping the hydraulic apparatus, and an open position supplying fluid to the same so that it rotates. Pressure is exerted in chambers at the ends of the valve slide to hold the same balanced in the closing position. When a pressure differential between the chambers is produced by rotation of control means, the valve slide moves to the open position so that the hydraulic apparatus rotates, and also drives the valve slide in synchronism with the control means so that the valve slide remains in the open position until rotation of the control means is stopped. As a result, the hydraulic apparatus rotates only when the control means rotates.

3,665,808

PUMPING SYSTEM FOR LIQUID HYDROCARBONS AND THE LIKE

Walter H. Vestal, 820 Silver Avenue, Greensboro, N.C.

Filed Oct. 7, 1970, Ser. No. 78,820
Int. Cl. F01l *15/16, 31/02*; F04b *17/00, 35/00*
U.S. Cl. 91—272 5 Claims



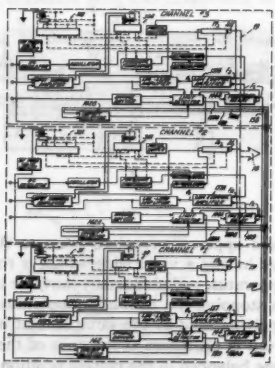
Gasoline or other liquid hydrocarbons are safely, rapidly, and economically pumped from a storage tank to one or more metering dispensers in a vehicle service station by a system including a high-speed air motor compactly arranged in axial alignment with a pump and a motor operating valve assembly of novel construction. The motor is powered by compressed air from a standard source such as found in virtually all vehicle service stations. The air is treated before introduction into the motor and its valve assembly to prevent freeze-jamming of the components during their operation at the high speeds necessary for the attainment of commercially acceptable pumping volumes or gallons per minute. An expansion chamber is preferably provided in series with the discharge line of the pump to dampen the pulsating flow therefrom and thus insure relatively uniform flow of liquid to the metering dispenser.

3,665,809

MULTIPLE CHANNEL REDUNDANT CONTROL SYSTEM

Colin Graham Walker, Chomedy, Laval; Edward John Leadbeater, Montreal; Ralph Fredrick Darlington, Lachine; Edmond Michael Traczyk, Val Morin, Quebec, all of Canada, and Charles A. Kubilos, Oxnard, Calif., assignors to Abex Corporation, New York, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,104
Int. Cl. F15b *9/03, 9/09*
U.S. Cl. 91—363 A 12 Claims



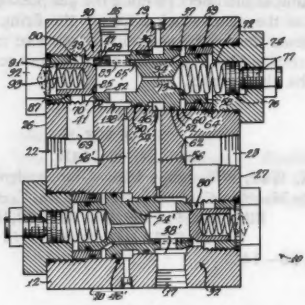
A multiple channel redundant electro-hydraulic servo system for controlling an aircraft guidance element. This system is redundant so that upon failure of one or more channels of the system, the remaining active channels still maintain control of the guidance element with a minimum of transient shift during shutdown of the failed channel.

3,665,810

DIFFERENTIAL PRESSURE HOLDING VALVE

John T. Parrett, Benton Harbor, Mich., assignor to Koehring Company

Filed Jan. 14, 1970, Ser. No. 2,826
Int. Cl. F15b *13/042*
U.S. Cl. 91—420 12 Claims



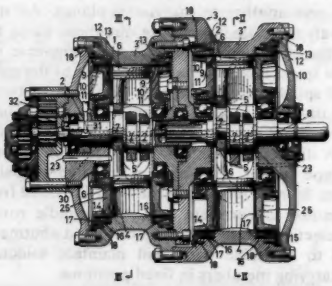
A holding valve for selectively preventing discharge flow from a hydraulic motor, the valve being biased to a closed position against the force of fluid tending to discharge from one side of the motor by discharge fluid acting on a piston formed integrally with the holding valve in addition to a spring also tending to close the valve, there also being provided an opposing pilot piston area on the holding valve which when pressurized opens the valve permitting discharge flow from the associated hydraulic motor.

3,665,811

ROTARY MACHINE

Gilbert Van Avermaete, 111 chemin des Espagnols, Arlon, Belgium

Filed July 1, 1969, Ser. No. 838,096
Claims priority, application Belgium, July 3, 1968, 60,537; June 24, 1969, 75,801
Int. Cl. F01b *1/06*
U.S. Cl. 91—492 11 Claims



A rotary machine such as a motor, a turbine, a pump, a compressor or the like comprises a rotor in a stator, the rotor being provided with at least one cylindrical chamber, the axis thereof being at right angles to the rotor axis; a piston in the chamber and mounted on the crank pin of a crank-shaft carried by the stator, the rotor being apertured in order to permit the passage and the rotation of the crank-shaft; sealing members on the rotor and the stator comprising at least one annular groove fitted in the stator on either side of the chamber, corresponding annular ribs on the rotor so that one rib engages each of the said grooves and plates fastened in

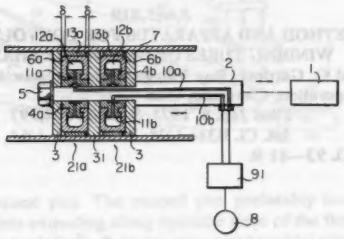
the stator and mounted across the annular groove in order to seal off the latter, the free rim of such plates being cut out in order to allow for the passage of the annular rib provided on the rotor and engaging the said groove.

3,665,812

APPARATUS FOR CONTROLLING RECTILINEAR MOTION

Yoshiaki Hashimoto, Nagoya, and Masatosi Hayakawa, Komaki, both of Japan, assignors to Chukyo Electric Co., Ltd., Komaki-shi, Aichi-ken, Japan

Filed June 22, 1970, Ser. No. 48,262
Claims priority, application Japan, July 1, 1969, 44/51500; July 18, 1969, 44/56430
Int. Cl. F15b *15/22*; B65h *59/10*
U.S. Cl. 92—24 3 Claims



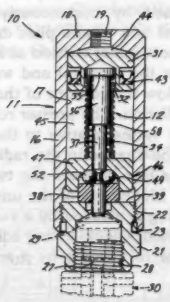
An apparatus for controlling rectilinear motion supplying fluid to the interior of a certain substance performing rectilinear motion along the guide, to expand the elastic body mounted on the substance, causing the elastic body to engage frictionally with the guide, whereby to make the substance stop abruptly, start or stop slowly, vary the speed, move steppingly, and perform clutch action.

3,665,813

SNAP OPERATOR FOR PRESSURE FLUID VALVE

Stanley M. Loveless, Oshtemo, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.

Filed Feb. 24, 1970, Ser. No. 13,306
Int. Cl. F15b *15/26*, *21/10*
U.S. Cl. 92—30 4 Claims



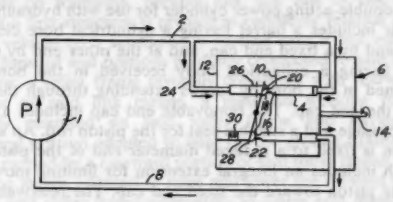
An automatically resettable, fluid-actuated, snap-acting operating device for controlling an external device, such as a spool valve assembly, particularly in response to a slow or erratic building pilot pressure. The operating device includes a housing having a chamber in which is slideably positioned a piston having a piston rod extending from the housing for actuating an external device. A detent mechanism is disposed for engagement with the piston rod for normally maintaining the piston in one end position. Pressurized fluid supplied to one end of the chamber causes the detent mechanism to snap out of engagement with the piston rod for permitting the piston and piston rod to move rapidly away from said one end position for causing actuation of the external device. A spring is positioned within the chamber between the piston and the detent mechanism for returning the piston to said one end position and for causing the detent mechanism to automatically re-engage the piston rod after the pressurized fluid has been vented from the chamber.

3,665,814

HYDRAULIC MOTOR CONTROL

Jay H. Ankeny, West Des Moines, Iowa, assignor to Delavan Manufacturing Company

Filed Aug. 20, 1970, Ser. No. 65,636
Int. Cl. F01b *3/00*
U.S. Cl. 92—71 2 Claims



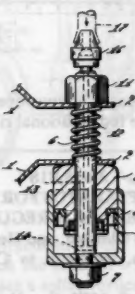
A hydraulic motor control wherein the cam plate of a hydraulic motor is selectively tilted by a hydraulic control piston which communicates with the high pressure fluid supply conduit of the motor. When the motor load is increased, the control piston will increase the tilt of the cam plate in response to an increase in the fluid pressure in the supply conduit and the torque of the motor will increase by an amount substantially greater than the increase in the fluid pressure in the supply conduit.

3,665,815

FLUID-OPERATED DEVICE

Edwin Ralph McIntier, Madison, Conn., assignor to Richard G. Sweitzer, Madison, Conn.

Filed Mar. 16, 1970, Ser. No. 19,880
Int. Cl. F01b *31/00*
U.S. Cl. 92—107 3 Claims



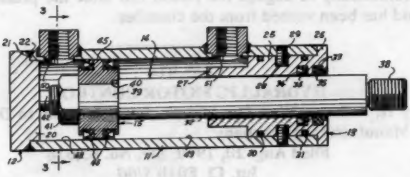
A device comprising a cylinder, a piston in the cylinder, a rod extending through the piston, the rod being fast to one end of the cylinder and projecting through the other end of the cylinder, the piston being slidable on the rod, a head on the outer end of the rod, the cylinder having a fluid inlet in said first end to force the piston toward said head so as to clamp an article between the piston and head, and a spring for retracting the piston when fluid pressure is stopped, the spring surrounding said rod between the piston and head and said inlet extending through the rod.

3,665,816

POWER CYLINDER CONSTRUCTION

James C. Caudle, 4712 Deville, Fort Worth, Tex.

Filed Nov. 10, 1970, Ser. No. 88,294
Int. Cl. F16j 15/18
U.S. Cl. 92—168 5 Claims



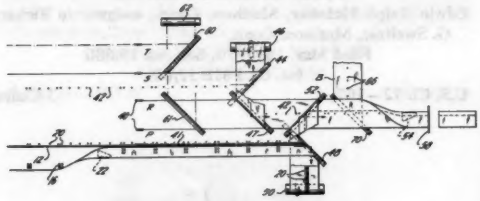
A double-acting power cylinder for use with hydraulic fluid or air includes a barrel having a cylindrical bore closed at one end by a fixed end cap, and at the other end by an end cap having a cylindrical body received in the bore, and retained in the bore by screws extending through the body into the end cap. The removable end cap includes a piston rod passage and a suitable seal for the piston rod. An annular piston is fixed to a reduced diameter end of the piston rod which includes an integral extension for limiting movement of the piston toward the fixed end cap. The removable end cap includes a boss for limiting piston movement in the opposite direction of reciprocation.

3,665,817

FORMING MULTIPLE PAGE PAMPHLET

Robert E. Katz, Livingston, and Frederick Grainger, North Plainfield, both of N.J., assignors to said Katz, by said Grainger

Filed Mar. 12, 1971, Ser. No. 123,543
Int. Cl. B31b 1/00
U.S. Cl. 93—61 R 10 Claims



Forming additional pages in envelope containing pamphlet from wider web or side fed additional ribbon.

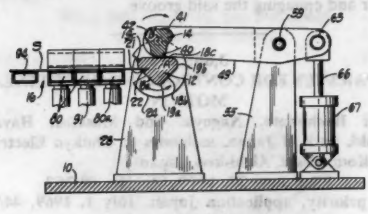
3,665,818

METHOD AND APPARATUS FOR CONVOLUTELY WINDING TUBES OF IRREGULAR SHAPES

Paul W. Stump, North Olmsted, and Heinz J. Bierstedt, Seven Hills, both of Ohio, assignors to Clevepak Corporation, Cleveland, Ohio

Filed Jan. 8, 1971, Ser. No. 104,996
Int. Cl. B31c 1/08; B31b 1/62, 1/64
U.S. Cl. 93—81 R 8 Claims

Multi-ply tubular members of non-circular cross-sectional shape are convolutely wound of sheet material on a mandrel of the desired non-circular shape. High bond strength is obtained by continuously pressing the sheet against the mandrel and wound plies during winding. For this purpose a presser roll of non-circular cross-sectional shape is biased against the mandrel and wound plies and rotated in timed relationship with the mandrel. The presser roll is shaped so that the combined distance from the axis of the presser roll to its surface and from the axis of the mandrel to its surface, in a plane



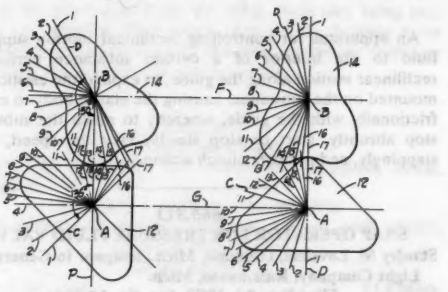
passing through the axis of each, remains constant during winding.

3,665,819

METHOD AND APPARATUS FOR CONVOLUTELY WINDING TUBES OF IRREGULAR SHAPES

Roland C. Gardner, Bay Village, Ohio, assignor to Clevepak Corporation, Cleveland, Ohio

Filed Jan. 8, 1971, Ser. No. 104,997
Int. Cl. B31c 1/08; B31b 1/62, 1/64
U.S. Cl. 93—81 R 11 Claims



Multi-ply tubular members of non-circular cross sectional shape are convolutely wound of sheet material on a mandrel of the desired non-circular shape. Improved high bond strength is obtained by continuously pressing the sheet against the mandrel and wound plies during winding and by maintaining the sheet under tension as it is wound. A presser roll, biased against the mandrel and wound plies, is irregularly shaped to follow the contour of the mandrel and wound sheet without oscillation. The presser roll is rotated at an angular velocity that varies relative to that of the mandrel, in accordance with the change in the radii of the mandrel and roll at the pressure line between the two, to establish equal surface velocities. Movement of the unwound portion of the sheet during winding is resisted by a vacuum table on which the sheet is supported. Quick-setting adhesives are applied to the sheet just prior to winding by a spray system or quasi-spray system.

3,665,820

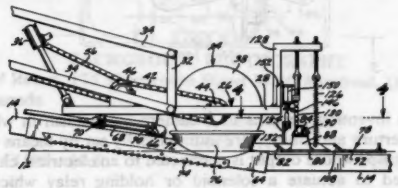
CONCRETE CONSOLIDATING AND SMOOTHING MEANS FOR INSERTER APPARATUS

Donald W. Rasmussen, Downey, Calif., assignor to Edoco Technical Products, Inc., Long Beach, Calif.

Filed Dec. 21, 1970, Ser. No. 100,226
Int. Cl. E01c 19/00
U.S. Cl. 94—39 8 Claims

A concrete consolidating and smoothing means for inserter apparatus of the type which is movable over an expanse of

plastic concrete and which includes inserter means to embed an elongated strip of joint material in the concrete at a predetermined depth. The consolidating and smoothing means comprises a first pan which is adapted to ride upon the surface of the concrete in trailing relation to the inserter means, and further comprises a second pan having a trailing portion adapted to ride upon the surface of the concrete in trailing relation to the first pan for smoothing the concrete surface. Vibration means are coupled to the first pan for vibrating the concrete to consolidate the concrete about the embedded strip, and the rate of vibration is adjustable. The first pan can be vibrated at a relatively high rate to effect good consolidation without affecting the capability of the second pan to achieve smoothing. The second pan is preferably mounted to the first pan by vibration isolation means so that vibration of the first pan is generally isolated



from the second pan. The second pan preferably includes lateral portions extending along opposite sides of the first pan to confine any relatively fluid concrete produced by vibration of the first pan and prevent it from flowing away, as would be the case on a slope. The relative lack of vibration of the second pan enables it to be used as the level sensor for coupling to the control means which controls the vertical position of the joint insertion means.

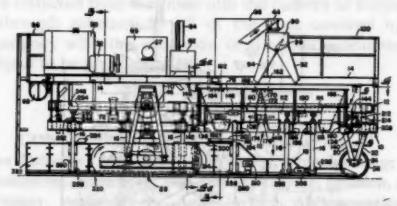
The movements of the first pan induced by the type of vibration means utilized causes the pan to travel in first and upward and forward direction, followed by downward and rearward movement and impact with the concrete surface. The pan thus has a stepping or creeping action rather than a dragging or sliding action upon the concrete surface. The consolidating action is enhanced by provision of variable rate vibration means upon the inserter means also.

3,665,821

CONTINUOUS CURB-FORMING MACHINE

Robert Walker, Shaker Heights, Ohio, assignor to Medusa Portland Cement Company, Cleveland Heights, Ohio

Filed Aug. 17, 1970, Ser. No. 64,251
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 **6 Claims**



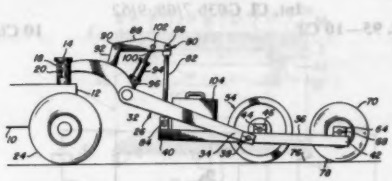
There is provided a curb-casting machine particularly useful in continuously casting high column concrete forms and which is characterized by a novel multistaged open-ended slip-form. The slip-form is carried upon a movable frame which is desirably, although not essentially, adjustable, which is in turn supported on a carrying frame. Locomotive means are provided for moving the carrying frame along a surface on which the casting is being laid.

3,665,822

MATERIALS WORKING MACHINE

Donald C. Speer, Glendale, Ariz., assignor to D. C. Speer Construction Co.

Filed May 20, 1970, Ser. No. 39,111
Int. Cl. E01c *19/26*
U.S. Cl. 94—50 R **3 Claims**



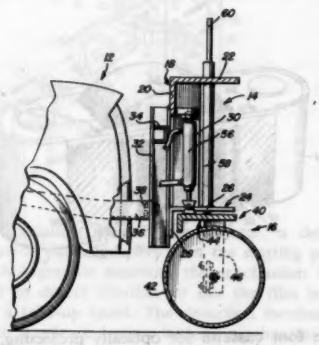
A materials working machine adapted to compact various materials on roadways, parking lots, soil fills or the like wherein a first structure is pivoted in cantilever relation to a towing vehicle on a substantially vertical axis; a link means having forward end portions pivotally connected to said first structure; a roller frame pivotally connected with rearward portions of said link means, a materials working roller pivotally mounted on said roller frame and having a peripheral portion adapted to bear on the ground, transport wheels carried by a rearward portion of said roller frame; and elevating means adapted to raise and lower the forward portion of said roller frame alternately to cause said materials working roller to bear on the ground or to elevate it above the ground so as to carry said roller frame on said transport wheels; which transport wheels are adapted to function selectively as pneumatic rollers.

3,665,823

ROLLER-ATTACHMENT FOR VEHICLES

Clarence E. Chaney, 907 Louis Lane, Kingsville, Md., and Wendell L. Haddox, Jarrettsville, Md.

Filed Oct. 27, 1970, Ser. No. 84,420
Int. Cl. E01c *19/26*
U.S. Cl. 94—50 R **8 Claims**

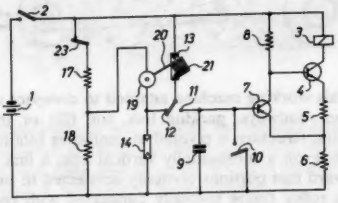


A road patching implement in the nature of a roller attachment mountable on the front of a self-propelled vehicle. The attachment includes a roller vertically adjustable so as to transfer the weight of the forward portion of the vehicle thereto. The roller is mounted on a roller frame which is in turn vertically adjustable relative to a mounting frame. The mounting frame is releasably fixed to the vehicle. The roller is stabilized relative to the mounting frame and guided during the vertical adjustment relative thereto by means of elongated guide tubes or sleeves on the mounting frame which slidably receive elongated guide rods fixed to the roller frame. The selective vertical adjustment of the roller and roller frame is effected by power means.

3,665,824
PHOTOGRAPHIC APPARATUS WITH AUTOMATIC EXPOSURE CONTROL

Karl Wagner, Ottobrunn, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 31, 1970, Ser. No. 59,999
Claims priority, application Germany, Aug. 6, 1969, P 19 39 950.9
Int. Cl. G03b 7/08, 9/62
U.S. Cl. 95—10 CT 10 Claims

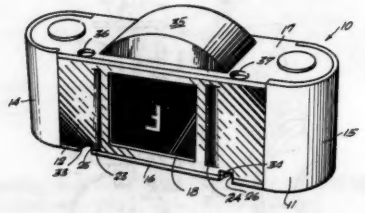


The difference in voltages across two photoconductors, one exposed to direct scene light and the other to scene light that has passed through the camera objective, drives a moving-coil instrument, the pointer of which controls a movable mask that more and more shields the second photoconductor until the voltages across the two photoconductors are approximately equal. A capacitor then charges through the second photoconductor to a voltage that closes the shutter.

3,665,825
FILM FONT CASSETTE

Murray Friedel, North Miami Beach, Fla., assignor to Visual Graphics Corporation

Filed Apr. 17, 1970, Ser. No. 29,402
Int. Cl. B41b 17/26
U.S. Cl. 95—4.5 7 Claims

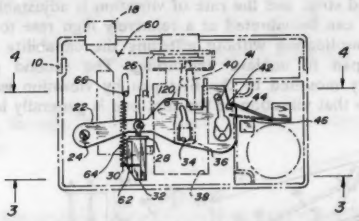


A film font cassette for optically projecting, selectively, film font images for use in phototypographic composition equipment is described. A film strip having type character images printed in fonts of the type is rollably supported between a pair of reels within each side of the cassette and moveable past a central projection window. The reels include gear means at the bottom of the cassette interengageable with reel-turning mechanism in the equipment with which the cassette is to be used for selectively moving a film image into projecting position within the cassette projection window. Guide mechanism within the cassette and cooperative with indexing means on the equipment with which the cassette is to be used effects precise registration of the film and its image to be projected with the optical system of the equipment.

3,665,826
SOLENOID-ACTUATED MASK FOR AUTOMATIC EXPOSURE CONTROL FOR CAMERAS

Zvi Y. Karpol, Bronx, N.Y., assignor to Keystone Division-Berkey Photo, Paramus, N.J.

Filed Jan. 19, 1971, Ser. No. 107,816
Int. Cl. G03b 7/08, 9/58, 9/10
U.S. Cl. 95—10 CD 13 Claims

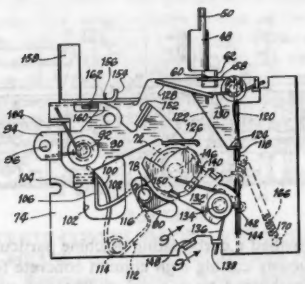


This invention pertains to a camera mechanism in which the aperture and shutter are automatically set by means of a light sensor whose output is connected to an electrical circuit disposed to actuate a solenoid or holding relay which is operatively engaged to a pivotal arm having a mask portion with contoured apertures movable in front of both the aperture and light sensor. This arm is frictionally retained upon a pivot pin and is moved from an "at-rest" condition to a determined exposure condition by means of the solenoid as it is moved by the shutter release lever. The mask arm in its normal or "at-rest" condition is disposed in the maximum open condition to provide a maximum exposure to the film when the shutter is actuated. During the movement of the release lever the mask arm is moved by means of the holding action of the actuated moving solenoid until a correct setting of aperture and shutter has been achieved as ascertained by the light sensor output. When this setting is reached the current to the solenoid is cut off, releasing the holding action of the solenoid to the mask arm. This arm, after it is released, and because of the friction at the pivot pin, is caused to stop at this correct setting.

3,665,827
FLASH LAMP ACTUATING STRUCTURE

George Irwin, Highland Park, Ill., assignor to Imperial Camera Corp., Chicago, Ill.

Filed Nov. 25, 1970, Ser. No. 92,568
Int. Cl. G03b 15/04
U.S. Cl. 95—11.5 R 11 Claims



A flash lamp actuating structure for a camera having means for holding a length of film, film advancing means, and a shutter means for exposing successive frames of film. The shutter means includes at least one movable plate having

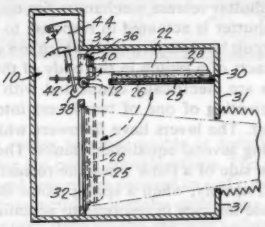
an opening for registering with a camera lens opening when the plate is moved during shutter operation. A flash bulb of the type which will operate in response to impact imparted by a spring loaded finger is adapted to flash in the course of film exposure. The spring loaded finger is engaged for impact movement by a push bar which is normally retained against movement. During an initial stage of shutter actuation, a spring means is wound whereby energy is stored in the spring means. A push bar actuating member is adapted to be operated by this spring means, and this operation occurs at a later stage of the shutter actuation when the means for retaining the push bar is moved out of the way. The spring energy is released rapidly whereby the push bar will be driven with sufficient force and speed into engagement with the flash lamp impact finger. The push bar also defines means for engaging the shutter plate whereby the film exposure is dependent upon the movement of the push bar.

3,665,828

BACKGROUND PHOTOGRAPHY

Josef Reiter, 175 Sherbrooke Street West, Montreal, Quebec, Canada

Filed June 1, 1970, Ser. No. 42,337
Int. Cl. G03b *15/10*
U.S. Cl. 95—11 R **13 Claims**



A camera including a device for mounting a transparency therein for movement from an operative position in intimate contact with the film to be exposed and an inoperative position clear of the film. A photographic method or system including double exposing the film with the first exposure being made with a transparency in intimate contact with the film by backlighting the object to be photographed to silhouette the object on the film and to expose the transparency onto the film except for the area silhouetted and then removing the transparency and moving a substantially nonreflecting backdrop into position behind the object and frontlighting the object for the second exposure. Where larger backgrounds are required, a reflecting mask having an opening through which the object to be photographed is viewed, is used and during the first exposure the object is backlit and light is reflected from the mask into the camera to expose the film through substantially all of the area covered by the transparency with the exception of the area silhouetted by the object to be photographed.

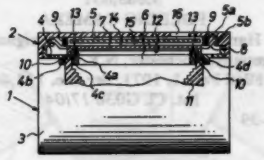
3,665,829

CONTAINER FOR PHOTOGRAPHIC FILM

Johann Putscher, Munich; Josef Gersch, Unterhaching; Otto Wiedemann, Starnberg, and Alfred Winkler, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 12, 1970, Ser. No. 45,874
Claims priority, application Germany, June 19, 1969, P 19 31 117.2; Aug. 13, 1969, P 19 41 101.9
Int. Cl. G03b *1/48, 17/26, 19/04*
U.S. Cl. 95—31 CA **7 Claims**

A container for photographic film has a hollow web connecting a film-supplying chamber with a film-collecting chamber. The front wall of the web has a window which exposes one film frame at a time and such frame is held at a fixed distance from the picture-taking objective of the camera by locating surfaces provided on pins forming part of the rear wall of the web or of a plate which is mounted in the web behind the exposed film frame. The pins extend through



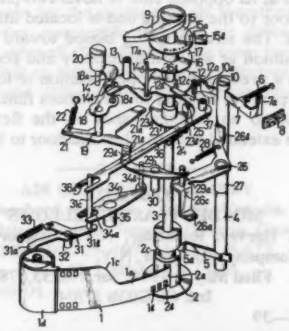
openings of the front wall of the web and abut against a stop in the camera body. The plate is biased forwardly by springs installed in a recess of the rear wall and has legs which engage abutments of the front wall to arrest the plate in its foremost position when the container is withdrawn from the camera body.

3,665,830

FILM TRANSPORT MECHANISM

Keisuke Maeda, Sumie-Higashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 17, 1970, Ser. No. 64,429
Claims priority, application Japan, Aug. 10, 1970, 45/60892
Int. Cl. G03b *1/06, 1/62*
U.S. Cl. 95—31 FL **6 Claims**



In operative relation with a film counter, a detection mechanism detects film transport from the starting position to the first photographic position, the mechanism further being adapted to detect whether or not the film is being wound up on a take-up spool. The detection mechanism is associated with a release button locking mechanism and a film transport blocking mechanism so that until a predetermined amount of film has been wound up on the take-up spool, the film can be advanced without releasing the shutter. Upon detecting the winding of a predetermined amount of the film, the film transport blocking mechanism blocks the film winding operation and the release button is freed from locking. In operative relationship with subsequent shutter release and film winding operation, normal release button locking and film transport blocking operations are effected. Also mounted in the camera in operative relationship with the above mechanisms in another detection mechanism to be actuated upon detecting the loading of a film magazine, the magazine detection mechanism being so adapted that when a film magazine is not loaded the film transport blocking mechanism and the release button locking mechanism are al-

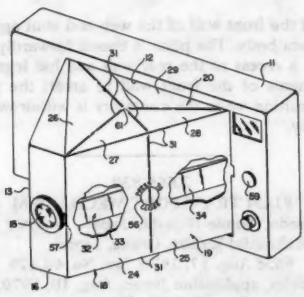
lowed to function in operative relationship with film winding and shutter release operations and that upon detecting loading of the magazine, the magazine detection mechanism frees the film winding mechanism, permitting the foregoing mechanisms to operate accurately.

3,665,831

FOLDING CAMERA

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,468
Int. Cl. G03b 17/04
U.S. Cl. 95—39 6 Claims



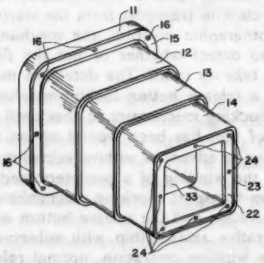
A folding camera is provided with a lens support door hinged at one end to the camera housing and supporting the camera lens at its opposite end. A novel two-piece strut connects the door to the housing and is located inside a following bellows. The strut is spring biased toward an extended locked condition at which it accurately and positively holds the door in a predetermined open position to locate the lens in proper operative relation to the camera film. Finger pressure applied to an indicated spot on the flexible bellows releases the extended strut to allow the door to be closed.

3,665,832

MOLDED PLASTIC BELLOWS

Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1970, Ser. No. 33,678
Int. Cl. G03b 17/04
U.S. Cl. 95—39 10 Claims



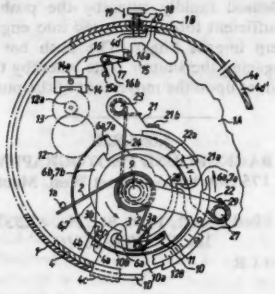
A one-piece molded plastic bellows particularly suited for use in a photographic camera comprises a plurality of relatively rigid telescoping sleeves joined in lighttight relation to one another by integral flexible membranes which define the relative positions of the sleeves when the bellows is extended.

3,665,833

DELAYED SHUTTER RELEASE MECHANISM FOR PHOTOGRAPHIC APPARATUS

Manfred Muller, Donaueschingen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 23, 1971, Ser. No. 136,845
Claims priority, application Germany, Apr. 24, 1970, P 20 19 908.0
Int. Cl. G03b 9/64
U.S. Cl. 95—53.3 22 Claims



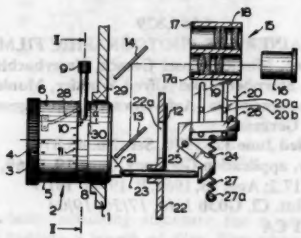
A delayed shutter release mechanism for use with cameras wherein the shutter is actuated in response to completion of an electric circuit has two terminals which are connectable to separate contacts of a switch in the body of the camera. The two terminals are electrically connected with each other in response to pivoting of one of two levers into contact with the other lever. The levers have followers which track a rotary cam having several equidistant flanks. The followers are located at one side of a flank when the release mechanism is ready for use, namely, when a spring motor stores sufficient energy to rotate the cam in response to actuation of a trigger. The levers remain out of contact with each other while a flank of the cam moves toward and past one of the followers. The one follower is then caused to change its angular position and to place the respective lever into contact with the other lever. The levers remain in contact during the interval which elapses while the flank of the cam moves between the two followers. The distance between the two followers is adjustable to thereby change the length of the interval during which the two levers contact each other.

3,665,834

MOTION PICTURE CAMERA WITH ZOOM LENS

Richard Loewe, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart-Untertuerkheim, Germany

Filed Aug. 12, 1970, Ser. No. 63,097
Claims priority, application Germany, Aug. 16, 1969, P 19 41 789.1
Int. Cl. G03b 3/00, 13/16, 13/26
U.S. Cl. 95—44 R 10 Claims



A motion picture camera wherein the lever which is movable to change the focal length of the zoom lens controls a

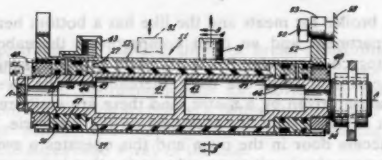
carriage which moves a system of magnifying lenses into registry with the eyepiece of the through-the-lens viewfinder so that the user can see a greatly enlarged portion of the image prior to and during manipulation of the focusing ring. The lever places the magnifying lenses into registry with the eyepiece of when the zoom lens is adjusted for maximum focal length. A leaf spring in the lens mount biases the lever to a position in which the lever permits movement of the magnifying lenses out of registry with the eyepiece and places a second system of lenses into registry with the eyepiece. The second system of lenses does not appreciably magnify the viewed image.

3,665,835

FLUID TYPE ROTARY ACTUATOR

Charles E. Oates, Los Angeles, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Aug. 14, 1969, Ser. No. 850,270
Int. Cl. F01c *9/00*
U.S. Cl. 92—121 **3 Claims**



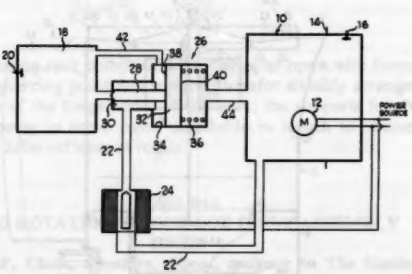
A fluid-type rotary actuator usable in installations where weight and space are prime considerations. The actuator having packing gland assemblies secured to and rotating with the output shaft of the actuator thereby eliminating stepped construction of the wall defining the actuator's chamber thus insuring the fluid pressure acting to impart rotation to the actuator will be applied at a location resulting in maximum torque. The actuator also includes a floating feature resulting in isolation of substantially all radial loads acting on the actuator.

3,665,836

ATMOSPHERE SUPPLY SYSTEM FOR MOTORS

Emil A. Kubiak, Novelty, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,066
Int. Cl. B64d *13/04*
U.S. Cl. 98—1.5 **3 Claims**



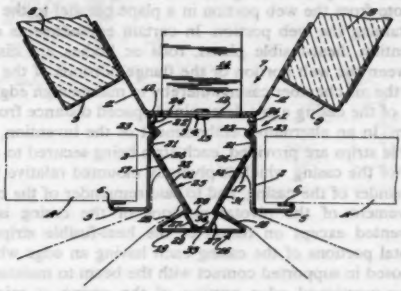
System for maintaining an atmosphere at a desired pressure in a shell containing a motor, the shell being subjected to conditions such that leakage of atmosphere and reduction in pressure may occur.

3,665,837

LINEAL AIR DIFFUSER BAR

Glenn F. Balfanz, Jr., Western Springs, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.

Filed May 13, 1970, Ser. No. 36,946
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 D **18 Claims**



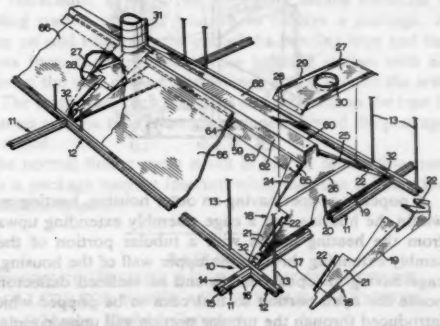
An air diffusing assembly for use in a suspended ceiling system employing a plurality of ceiling panels, comprising an inverted channel-shaped structure having means along the sidewalls thereof for supporting ceiling panels, the intermediate connecting portion of the channel structure having openings therein for the supply of air to the channel interior, and provided with means engageable with a supply duct for supplying air thereto, such assembly having an air diffuser member, of generally V-shape in transverse cross-section, disposed in the channel member with the side walls thereof downwardly converging, at least one of such sidewalls having openings therein for the passage of air therethrough, and a damper member cooperable with the air diffuser member and having a sidewall slidable along the inner face of the air diffuser member to selectively vary the effective size of the openings in said diffuser sidewall for controlling air flow therethrough.

3,665,838

AIR CHAMBER ASSEMBLY

Charles G. Shepherd, Oakville, Ontario, Canada, assignor to Wilson Lighting Limited, Toronto, Ontario, Canada

Filed Jan. 29, 1970, Ser. No. 6,673
Int. Cl. F24f *11/02*, *13/06*
U.S. Cl. 98—40 DL **17 Claims**



An air chamber assembly including two adjacently disposed fluorescent lighting units mounted in the ceiling of, for example, a commercial office or school, the assembly comprising an air chamber which is located within a space

between the two lighting units and which is defined by a hollow air chamber casing, or air boot. The casing is formed with a ventilation air inlet duct through which air having the desired temperature and humidity may be supplied to the interior of the casing from a suitably located source of such air within the associated building. The assembly also comprises a support beam which is of inverted channel form in cross-section and which has a web portion, depending parallel limb portions, and outwardly directed flange portions projecting from the longitudinal edges of the limb portions of the beam remote from the web portion in a plane parallel to the plane containing the web portion. In certain embodiments of the invention, heat-fusible plates, rods or bodies are disposed between the web portion or the flange portions of the beam and the air chamber casing, thereby to maintain an edge portion of the casing a pre-determined spaced distance from the beam. In an alternative embodiment of the invention, heat-fusible strips are provided, each strip being secured to a portion of the casing which is pivotally mounted relative to the remainder of the casing, and to said remainder of the casing. Movement of the pivotal portions of the casing is thus prevented except on fusion of the heat-fusible strips, the pivotal portions of the casing each having an edge which is disposed in supported contact with the beam to maintain the above-mentioned edge portion of the casing at said pre-determined distance from the beam except on pivotal movement of the pivotal portions of the casing. The pre-determined spaced distance between the above-mentioned edge portion of the casing and the beam defines a ventilation air outlet duct through which ventilation air may flow from the interior of the casing to the room space or the like below the assembly, the casing being urged under gravity in the downward direction to cause this edge portion of the casing to enter into air-tight sealing contact with the flange portions of the beam on fusion of the heat-fusible plates, rods, bodies or strips.

3,665,839

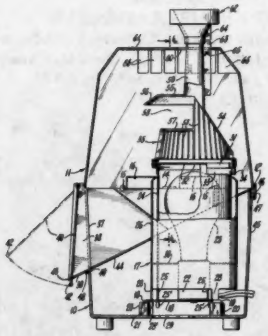
POPCORN POPPER

Robert Gottlieb, 185 West End Avenue, New York, N.Y.

Filed Mar. 25, 1970, Ser. No. 22,415

Int. Cl. A23l *1/18*

U.S. Cl. 99—238.6 **7 Claims**



A popcorn popper having an outer housing, heating means within the housing and a cage assembly extending upwardly from the heating means with a tubular portion of the assembly extending through the upper wall of the housing, the cage having an open portion and an inclined deflector opposite the open portion so that corn to be popped which is introduced through the tubular portion will upon popping be deflected by the deflector through the open portion of the cage and retained within that portion of the outer housing surrounding the heating means. The outer housing also includes an inclined bottom portion and a hinged closure which can be opened to remove the popped corn.

3,665,840

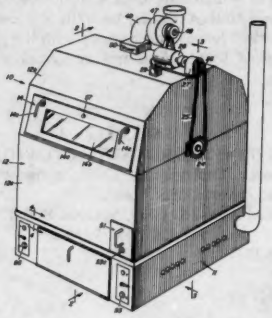
BROILER INCLUDING COOKING PLATE

Johnny O. Horany, P.O. Box 3334, Enid, Okla.

Filed Sept. 9, 1970, Ser. No. 70,785

Int. Cl. A23b *1/04*

U.S. Cl. 99—261 **3 Claims**



A broiler for meats and the like has a bottom heat supply compartment and an oven compartment thereabove. The heating compartment has a top plate totally closing off the compartment from the oven thereabove. The oven has a rotisserie driven by a motor, and there are easily-removable meat carrying shelf-like members on the rotisserie. There is an access door in the oven and this operates a switch in a power supply circuit to an exhaust fan that is operated when the access door is open. Towards the bottom of a side wall of the oven there is an access passageway in which is received a box-like element with an apertured top portion and having an electric heating element to burn smoke creating chips. A thermostat element in the oven is connected to a heating means in the heating compartment to control the temperature in the oven.

3,665,841

BEVERAGE MAKER

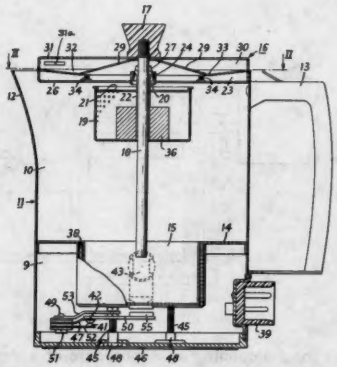
Graham George Hardy, Stoke-on-Trent, and Leonard Kenneth Morgan Masters, Newcastle-under-Hyme, both of England, assignors to Russell Hobbs Limited, Alperton, England

Filed May 13, 1970, Ser. No. 36,895

Claims priority, application Great Britain, June 11, 1969, 29,597/69

Int. Cl. A47j *31/00*

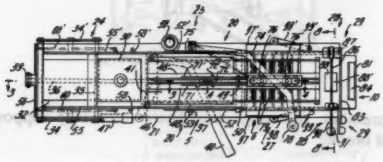
U.S. Cl. 99—281 **12 Claims**



A receptacle for tea leaves, coffee grounds or the like is releasably supported in the upper part of an electrically

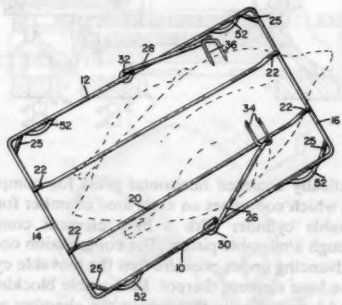
heated vessel by holding means until liquid in the vessel boils, whereupon a heat-responsive device, in response to heating by vapor from the boiling liquid, will effect the release of the receptacle so that it falls to a lower position where the liquid can flow into it. The descent of the receptacle also effects the interruption of the supply circuit of the heating means of the vessel.

3,665,842
TOASTING APPARATUS
Aniceto R. Visitacion, 705 West 179th Street, New York, N.Y.
Filed Sept. 17, 1970, Ser. No. 72,986
Int. Cl. A47j *37/08*
U.S. Cl. 99—332 **12 Claims**



An apparatus for toasting slices of bread constituting a hopper, feeder means for feeding the bread slices to a heated toasting section, operating means for moving the toasted slices from the toasting section to a buttering device and then to cutter means, and delivery means for depositing the toasted cut slices onto a tray or the like.

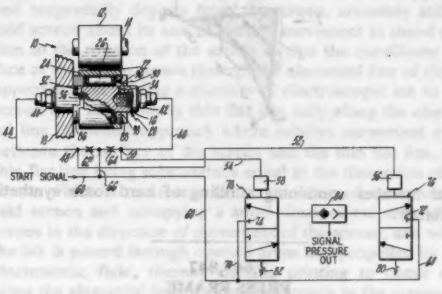
3,665,843
ROASTING RACK
Raymond D. Moore, 56 Eagle Road, Worcester, Mass.
Filed Nov. 19, 1970, Ser. No. 90,895
Int. Cl. A47j *37/04*
U.S. Cl. 99—419 **3 Claims**



A roasting rack comprising a rectangular open wire frame, a roast piercing point and support therefor slidably arranged on each of the longer sides of the rack; the supports for the points being in some cases adjustable in length to accommodate different sizes of roasts.

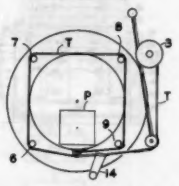
3,665,844
ZERO ROTATION SENSOR FOR DRIVE ASSEMBLY IDLER
Robert P. Clark, Cheshire, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed June 8, 1970, Ser. No. 44,380
Int. Cl. B65b *13/18*
U.S. Cl. 100—4 **8 Claims**

Apparatus for use in a material handling machine and including drive means and an idler for maintaining material being driven by the drive means in engagement therewith, the idler being rotatable responsive to movement of the



material, and a zero rotation sensor in the idler for detecting when the idler stops rotating for indicating a motionless condition of the material.

3,665,845
BANDING MEANS
Floyd A. Lyon, Brookville, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.
Filed Oct. 12, 1970, Ser. No. 80,071
Int. Cl. B65b *13/12*
U.S. Cl. 100—27 **4 Claims**



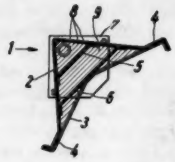
A banding machine having an encircling means mounting four retractable fingers. The encircling means encircles a banding station which is adapted to receive a package. A clamp on said ring grips the end of the banding tape and the fingers form the tape around the banding station with no strain on the tape caused by snubbing action around the article. The fingers are then retracted and the slack in the tape is taken up and the tape is snugly wrapped around the package and sealed.

The normal timing cycle is cut in half in production runs since a package may be inserted while the tape is being fed around the fingers.

3,665,846
PROTECTIVE SHIELD FOR USE AT THE BITE OF ROLLERS FOR PAPER AND TEXTILE CALENDERS
Jurgen Schlunke, Krefeld, Germany
Filed Jan. 11, 1971, Ser. No. 105,218
Int. Cl. B30b *3/04*
U.S. Cl. 100—162 **6 Claims**

A protective shield for use at the bite of rollers of paper and textile calenders, which consists of a hollow longitudinal

member of triangular cross section formed by angle-shaped plate means connected to each other, said hollow longitudinal member containing a filling of hard foam synthetic material.



3,665,847

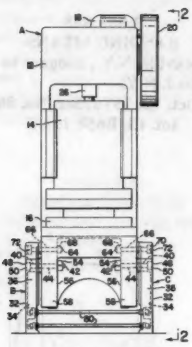
PRESS FRAME

Robert A. Helrigel, and Roderick K. Ward, both of Hastings, Mich., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Jan. 14, 1971, Ser. No. 106,408

Int. Cl. B30b *15/28*

U.S. Cl. 100—231 **18 Claims**



A press frame includes spaced-apart legs having inner surfaces facing one another. Tie rods are releasably attached to the legs for holding the legs together. The connection between the legs and the tie rod is located entirely on the inner surfaces of the legs so that no projections appear on the outer surfaces of the legs.

3,665,848

APPARATUS FOR COMPRESSING SCRAP INTO A BLOCK AND CONVEYING THE SAME

Kenji Kimura; Kousaku Watando, and Osamu Kadota, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

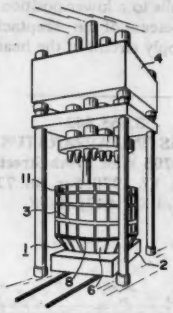
Filed Nov. 12, 1970, Ser. No. 88,518

Claims priority, application Japan, Sept. 19, 1970, 45/81828

Int. Cl. B30b *15/32*

U.S. Cl. 100—218 **8 Claims**

An apparatus for use in compressing and conveying scrap metal or other blocks which includes a supporting chain comprising a plurality of segment chains releasably connected to each other by connecting pieces at both ends, a open ended tubular member forming press side walls and acting as a block carrier, and a base support provided with a groove for receiving the supporting chain. The supporting chain is secured to the bottom edge of the tubular member, and the tubular member is removably mounted on the support to receive the scrap which is pressed when the tubular member is mounted on the support. Upon removal of the tubular member, the supporting chain releasably supports the pressed block.



3,665,849

HORIZONTAL PRESS FOR COMPACTING SCRAP METAL

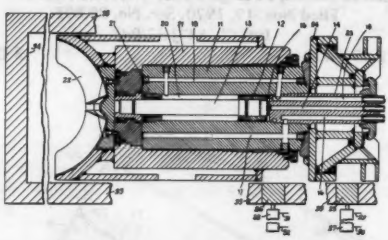
Angelo Muraro, via Val Chiampo, Montorno, and Giovanni Busi, via Kossuth 12, Brescia, both of Italy

Filed Mar. 9, 1970, Ser. No. 17,502

Claims priority, application Italy, Mar. 13, 1969, 61536 A/69

Int. Cl. B30b *5/00*

U.S. Cl. 100—245 **2 Claims**



A hydraulically actuated horizontal press for compacting scrap metal which comprises an elongated chamber for loading, a movable cylinder with a base element connected thereto through a movable piston. The compression occurs in stages by advancing under pressure first the movable cylinder and then the base element thereof. Removable blocking keys are arranged longitudinally throughout the chamber and are activated to immobilize either the cylinder or the base element after each advance.

3,665,850

SELECTIVE BELT PRINTING APPARATUS FOR PRINTING A LINE AT A TIME

Ralph Berger, McLean, Va., and Howard Satterlee, Madeira Beach, Fla., assignors to New England Merchants National Bank, Boston, Mass.

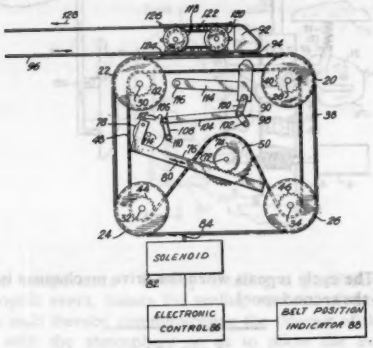
Filed Aug. 25, 1969, Ser. No. 852,697

Int. Cl. B41j *9/38, 1/20*

U.S. Cl. 101—93 C **13 Claims**

Printing apparatus is provided in which an entire line of print is printed at one time and wherein a sheet of paper is advanced past a printing station so that a series of lines of printing can be successively printed thereon. The printing is effected in a plurality of parallel columns, with which are

aligned a like number of belts on which are located the print characters. These belts are driven by one or more drums in repetitive cycles. In each cycle each of the belts is brought to a halt with the desired character at the printing line in the printing station and when a line of print has been thusly compiled, a single hammer unit drives the characters against a



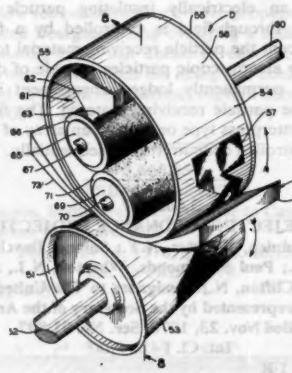
ribbon to print the line on the paper. The belts are then returned to an initial position of rest in preparation for the next succeeding cycle for the next succeeding line of print. The print hammer may be actuated from the same source of power which drives the drum or drums and there may be related to this source of power a stepping device which steps the paper through the printing station.

3,665,851

ELECTROSTATIC SCREEN PROCESS PRINTING

James W. Edwards, Creve Coeur; Harry J. Larrigan, St. Louis, and Shelly W. Mays, Jr., St. Louis, all of Mo., assignors to Electrostatic Printing Corporation of America, San Francisco, Calif.

Filed July 19, 1965, Ser. No. 472,829
Int. Cl. B41f *17/18*
U.S. Cl. 101—114 **36 Claims**



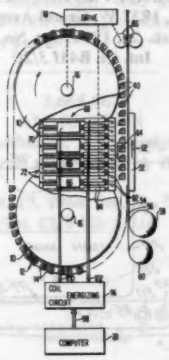
1. The method of electrostatically screen process printing articles which have a central axis and an annular surface of revolution about said central axis, with a screen which has a curvilinear surface and can be arcuately shifted about an axis of movement, said screen also being curved with respect to said axis; said method comprising establishing an electrostatic field between said screen and said article, establishing an axis of rotation of said article concentric with its central axis and in a position so that a line of closest approach to said screen is parallel to the curvilinear surface of said screen, rotating said article about its central axis so that the annular surface to receive the ink tangentially approaches, forms an instantaneous elemental line of closest approach and tangentially departs from the screen, arcuately shifting said screen about its axis of shifting movement in timed relation to the rotation of the article so that the curvilinear surface of the screen passes through the elemental line of closest approach, and feeding a quantity of electroscopic ink to said screen in a substantially thin flat line only along the elemental line of closest approach where relative movement exists between the surface of the screen and the thin flat line, said thin flat line being substantially equal to the dimension of the screen which is transverse to the direction of movement of said screen and occupying a small dimensional area of the screen in the direction of movement of the screen, and where the ink is passed through opened areas and propelled by said electrostatic field, thereby causing printing to occur only along the elemental line of closest approach to the screen.

3,665,852

HIGH SPEED FRONT IMPACT PRINTER

Richard H. Harrington, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 19, 1970, Ser. No. 3,664
Int. Cl. B41j *1/20, 5/30*
U.S. Cl. 101—93 C **14 Claims**



A closed loop chain or train rotates continuously to move, along parallel paths, individual, laterally flexed, type carriers between a paper which moves continuously in the opposite direction and laterally shiftable latches. One end of a selected type carrier is momentarily arrested to deflect the type into contact with the moving paper for imprinting.

3,665,853

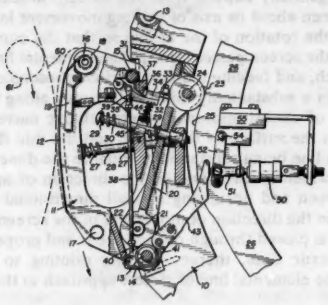
CONTINUOUS PRINTER AND SKIP-PRINT MECHANISM

Ruben J. Hartmeister, Golden, and John Hardy Maytag, Denver, both of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Filed Nov. 17, 1969, Ser. No. 877,279
Int. Cl. B41f *13/36, 17/22*
U.S. Cl. 101—247 **8 Claims**

A continuous printer and skip-print mechanism comprising a plurality of blanket holder segments on a rotated drum successively movable into and out of printing position, a stationary cam, a cam follower on each segment, and operative connections including a withdrawable bridge member between the cam follower and each blanket holder segment for moving the segment into printing position. An air cylinder or other suitable mechanism responsive to the malfunction

signal actuates a pivotally mounted trigger and connecting rod which are part of skip-print means for withdrawing the bridging member from the operative connections between the cam follower and each blanket holder segment, thereby



producing a gap in the operative connections and preventing movement of the segment into printing position when malfunction occurs, without interrupting subsequent printing operations.

3,665,854

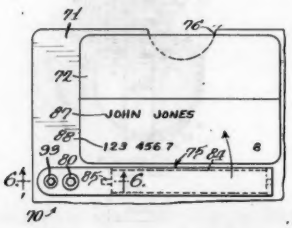
IMPRINTER INCLUDING TAPERED ROLLER TRAVELING IN AN ARCUATE PATH

Robert J. Maziarka, 1837 W. Grand Avenue, Niles, Ill.

Filed Feb. 25, 1970, Ser. No. 13,983

Int. Cl. B41f 3/20

U.S. Cl. 101—269 **1 Claim**



A portable imprinter that provides impressions on a pressure sensitive billing form from a credit card including a support for aligning the credit card in a predetermined direction and for holding the billing form in position, there being provided a pivotally mounted roller platen that rolls across the credit card indicia with a swinging action, with the roller having a taper thereon to minimize slippage, there being also provided a spring biased ball assembly for urging the free end of the platen downwardly toward the support and the credit card indicia to improve the imprinting quality.

3,665,855

SPRING-RETURNED POWER DRIVEN RIBBON

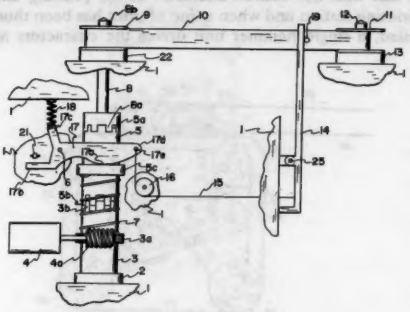
Christian Nikoloff, Concord, Calif., assignor to SCM Corporation

Filed Apr. 24, 1970, Ser. No. 31,652

Int. Cl. B41f 31/16

U.S. Cl. 101—336 **5 Claims**

A spiral spring coupled to a first spool is wound when ribbon from that spool is pulled onto a second spool by operation of a disengageable drive mechanism. When a predetermined amount of ribbon has been paid out, an eyelet on the ribbon trips a lever disengaging the drive mechanism and the spiral spring unwinds. The unwinding of the spring simultaneously causes the paid-out ribbon to be taken up on the first



spool. The cycle repeats when the drive mechanism is recoupled to the second spool.

3,665,856

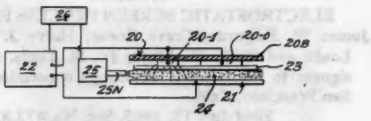
PRINTING METHOD USING ELECTRIC THROUGH-FIELD TO INDELIBLY LODGE PARTICLES

William C. Heller, Jr., 3521 North Shepard Avenue, Milwaukee, Wis.

Continuation of application Ser. No. 626,248, Mar. 27, 1967, now abandoned. This application Feb. 24, 1970, Ser. No. 14,718

Int. Cl. B41m 5/00

U.S. Cl. 101—426 **13 Claims**



A printing method and apparatus is disclosed employing an electric through-field for effecting deposit of electroscopic particles on an electrically insulating particle receiving material. The through-field is controlled by a field plate disposed adjacent the particle receiving material to establish a force on the electroscopic particles capable of driving the particles into permanently lodged engagement in the interstices of the particle receiving material. The field plates may be of a letterpress type or may be an array of individual field poles controlled concurrently or sequentially.

3,665,857

BASE EJECTING ORDNANCE PROJECTILE

Spencer I. Radnich, Webster, N.Y.; Samuel Davelman, Succasuna, N.J.; Paul S. Symonds, Wharton, N.J., and Willis H. Taylor, Clifton, N.J., assignors to The United States of America as represented by the Secretary of the Army

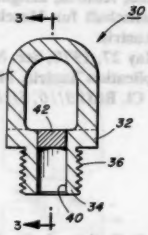
Filed Nov. 23, 1970, Ser. No. 91,897

Int. Cl. F42b 9/00

U.S. Cl. 102—1 R **11 Claims**

This disclosure is directed to a safety lifting plug for a base ejecting projectile which includes a cavity-defining body and at least one opening in the body for receiving the plug. The safety lifting plug is disclosed as including a top, a base means depending from the top which is receivable and rigidly engageable within the one opening, a lifting bar secured to the top, passage means formed in the plug through the top and the base means, and sealing means disposed in the passage means, which sealing means is manufactured from a

material the melting point of which is less than the "expelling charge reaction temperature" of expelling charge material to be carried by the projectile. Thus, where a projectile is provided with a safety lifting plug according to the invention, the experience of high environmental temperatures thereby, which temperatures are in excess of the "expelling charge



reaction temperature" thereby creating a possibility of a catastrophic event, causes the sealing material of the safety plug to melt thereby communicating the interior of the projectile with the atmosphere so as to allow the expelling charge gases to escape thereby to preclude the generation of undesired pressures within the projectile.

3,665,858

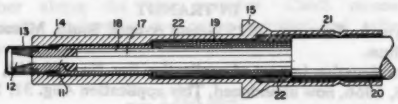
DETONATING FUZE

Bruce Travor, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Army

Continuation-in-part of application Ser. No. 770,962, Oct. 28, 1968, now abandoned. This application Sept. 22, 1970, Ser. No. 74,486

Int. Cl. F42b *19/08*

U.S. Cl. 102—27 R **4 Claims**



A high-low temperature shock-wave propagating fuze having a braided fiberglass lining overlying a radially exploding mild detonating cord. An abrasive resistant, flexible nonmetallic covering surrounds the lining and contains radial explosion and debris thereof without rupture between temperatures of −100° F. and +400° F.

3,665,859

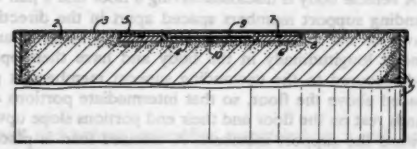
PRIMING DEVICE

Allen S. Caples, Baltimore, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed May 25, 1970, Ser. No. 40,156

Int. Cl. F42c *19/10*

U.S. Cl. 102—45 **4 Claims**



A priming device inside of a chamber includes a flat ring, in which is disposed a shallow cup that is encircled by an integral flange overlapping one side of the ring, to which one side of the flange is secured. The bottom of the cup has a hole through it and the cup contains pyrotechnic material. The opposite side of the flange is secured to a thin metal wall of the chamber. The material in the cup is detonated by striking the thin wall to bend it into the cup so that it will press against the pyrotechnic material.

3,665,860

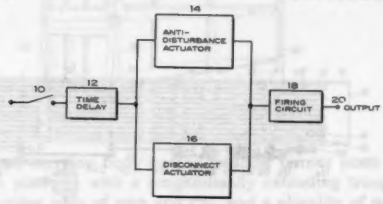
DETECTOR

Gaylon L. West, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 24, 1970, Ser. No. 101,216

Int. Cl. F42b *9/08, 23/26*

U.S. Cl. 102—70.2 **4 Claims**



A detector having an electronic arming delay timer, an antidisturbance firing mechanism, and a disconnect firing mechanism, wherein either firing mechanism is capable of causing detonation of a squib.

3,665,861

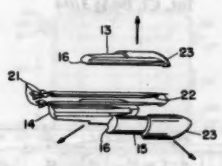
AMMUNITION

Howard Jaslow, Smithtown, N.Y., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 17, 1968, Ser. No. 768,979

Int. Cl. F42b *13/16*

U.S. Cl. 102—93 **2 Claims**



A sabot and sub-caliber projectile weapon having a plurality of individual sabot segments, each segment having a pair of parting surfaces and an intermediate internal surface. The internal surfaces define a sabot internal chamber in fluid communication with pressure gas when developed in environmental gun barrel.

3,665,862

CASELESS ROCKET CONTAINING SILANE POLYMER

George A. Lane, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 8, 1962, Ser. No. 179,511

Int. Cl. F42b *1/00;* **C06d** *5/00*

U.S. Cl. 102—103 **11 Claims**

1. A caseless rocket comprising an elongated solid propellant mass consisting essentially of an oxygen-containing oxidizer selected from the group consisting of inorganic and organic perchlorates and nitrates intermixed with a silane

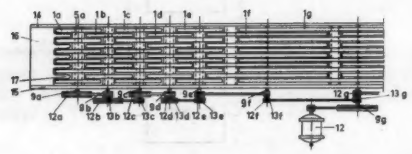
polymer selected from the group consisting of polydimethylsilane, polymethyl-hydrogensilane, polydihydrogensilane, copolymers and mixtures thereof reacted with a cross-linking agent for said silane polymer which solidifies and sets said silane polymer thereby to form a solid mass, the surface of said solid propellant mass being coated with a light weight coating having a maximum burning rate of less than 1 percent of that of said solid propellant mass on all sides other than one end.

3,665,863

VARIABLE SPEED CONVEYOR USING BELTS

Pierre Patin, 58, rue de Sevres, 92 Boulogne-sur-Seine, France

Filed Dec. 14, 1970, Ser. No. 97,926
Claims priority, application France, Jan. 5, 1970, 7000148
Int. Cl. A63g *1/00*; B65g *37/00*
U.S. Cl. 104—25 **3 Claims**



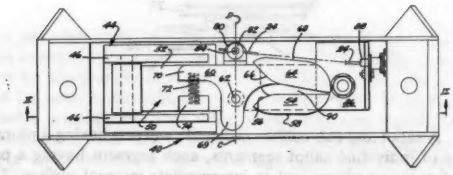
A variable speed conveyor or moving sidewalk has rows of spaced non-cylindrical support elements with belts supported thereon and driven at successively variable speeds from row to row. The belts provide plane moving paths and are driven by pinions on a drive shaft for each row. Spacers are arranged between belts and between support elements below the upper surface of the belts to fill gaps between the rows of support elements.

3,665,864

SENSOR FOR IN-FLOOR CONVEYORS

Jorgen S. Bildsoe, Royal Oak, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Mar. 31, 1970, Ser. No. 24,080
Int. Cl. B61j *3/04*
U.S. Cl. 104—88 **6 Claims**



A sensor for use in an in-floor truck-towing conveyor switching mechanism, the sensor utilizing two cooperating jaws which together are engaged by a selector pin pulled between the jaws by the truck on which it is mounted. One of the jaws is fixed and the other is pivoted for movement toward and away from the fixed jaw under the influence of the pin. Pivotal movement of the movable jaw causes a cable connected to the switch plate or responder to be pulled, actuating the responder so as to switch the truck to a spur or branch track. The jaws of the sensor are biased to project above the floor. Both of the jaws are horizontally pivotable so as to depress under the floor when engaged by an object other than the selector pin, such as a vehicle wheel, thereby preventing accidental actuation of the responder.

ERRATUM

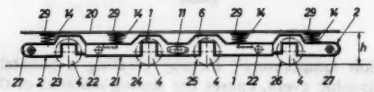
For Class 104—130 see:
Patent No. 3,666,050

3,665,865

LOW-PLATFORM RAILWAY CAR BOGIE

Friedrich Pelz, Vienna, Austria, assignor to Simmering-Graz-Pauker Aktiengesellschaft fur Maschinen-Kessel und Waggenbau, Vienna, Austria

Filed May 27, 1970, Ser. No. 40,917
Claims priority, application Austria, May 27, 1969, 4,990/69
Int. Cl. B61f *3/10, 5/18, 5/52*
U.S. Cl. 105—183 **3 Claims**



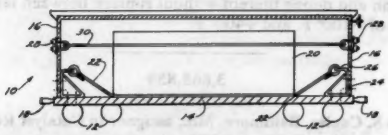
A rail vehicle which comprises a bogie, in which at least three wheel axles are mounted in a frame consisting of a main frame section and at least one additional frame section, which is mounted at the end of the main frame section for a vertical pivotal movement. The main frame section comprises a main crossbeam, which is provided with a bogie or king pin and is connected at least at one end to the side member of the frame by means which enable a pivotal movement of the two side members of the main frame section relative to each other.

3,665,866

METHOD AND APPARATUS FOR HANDLING ARTICLES IN TRANSIT

Wayne L. Swanson, 4525 Grand Avenue South, Minneapolis, Minn.

Continuation-in-part of application Ser. No. 579,712, Sept. 15, 1966, now abandoned. This application Aug. 31, 1970, Ser. No. 68,588
Int. Cl. B61d *45/00*; B60p *7/16*; B65j *1/24*
U.S. Cl. 105—369 A **9 Claims**



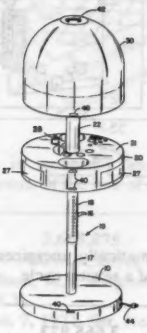
A vehicle body is disclosed having a floor and a pair of upstanding support members spaced apart in the direction of travel of the vehicle. Bands of strapping material are extended longitudinally in the body and have their opposite ends secured to the upstanding support members at points spaced above the floor, so that intermediate portions of the bands rest on the floor and their end portions slope upwardly toward the support members. A unitized load is placed on the intermediate portions of the bands and is spaced from the support members by the sloping band end portions, whereby upon impact the load may ride up the strap members to absorb impact energy.

3,665,867

COLLAPSIBLE UTILITY TABLE

Sharon L. Carlson, and Jenny M. Salado, both of 4809 Atherton Avenue 021, San Jose, Calif.

Filed Feb. 16, 1971, Ser. No. 115,628
Int. Cl. A47b *85/00*
U.S. Cl. 108—25 10 Claims



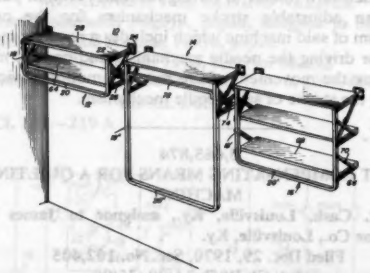
A collapsible utility table is disclosed which comprises a tubular member, a table top member providing a working surface mounted at one end of the tubular member, a cover member of given volume and a base member. The tubular member extends normally to the working surface and is wholly receivable within the volume of the cover member. The cover member includes means for detachably supporting the cover member on the free end of the tubular member. The base member includes means wholly receivable within the tubular member for detachably supporting the tubular member above the base member. Catch means for detachably supporting the cover member and table top member are described.

3,665,868

CLOTHES POLE AND SHELF COMBINATION

Oscar E. Kaeslin, 1444 S. W. 27th Court, Fort Lauderdale, Fla.

Filed Nov. 17, 1969, Ser. No. 877,231
Int. Cl. A47b *41/04*; A47h *1/00*
U.S. Cl. 108—29 1 Claim



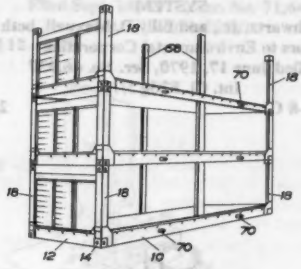
Shelf and hanger assemblies suspended on a wall having pairs of posts interconnected by hanger poles and spaced from the wall by bars abutting the wall below upper shelf supports. Pivotally extensible links provided with hanger notches interconnect the posts of adjacent shelf and hanger assemblies when laterally spaced on the wall.

3,665,869

LOAD-CARRYING BODIES

Theodore Howe, 17 Heyhouses Lane, St. Annes, Lancashire, England

Filed June 27, 1969, Ser. No. 870,156
Claims priority, application Great Britain, Aug. 2, 1968, 36,891/68
Int. Cl. B65d *19/18*
U.S. Cl. 108—53 9 Claims



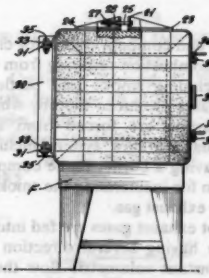
A load carrying body having foldable corner posts has a bottom platform with a longitudinally extending trough for transporting coils of wire and rod, and a plurality of support members are pivoted at opposite sides along the trough for movement between positions where they form continuations of the inclined sides of the trough and positions within the trough to form part of the platform top surface.

3,665,870

PREFABRICATED AND PRESTRESSED MODULAR FURNACE UNITS

Stephen Lewicki, Orchard Lane, Wallingford, Pa.

Filed Aug. 21, 1970, Ser. No. 65,817
Int. Cl. F23m *5/00*
U.S. Cl. 110—1 A 17 Claims



A prefabricated modular furnace unit built up of a plurality of longitudinally extending refractory brick elements to form a substantially closed perimetric figure in cross section. The bricks have juxtaposed mitered edges free of any mortar between them to permit them to move relatively to each other in radial directions in response to temperature variations. A spring-loaded sheath of high tensile strength on the exterior of the bricks maintains the unit in integrated compressed condition at all times while permitting expansion in response to thermal variations. The cross sections of the modular units may vary and the units of the same cross section may be combined to any length. The modular units may be closed at the ends thereof with either fixed or movable end closures of sheathed firebrick assemblies. Also, their thermal efficiency may be increased by providing bodies of

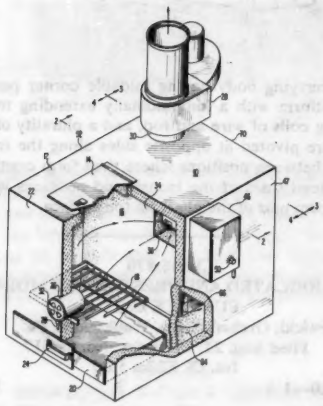
insulating material between the bricks and sheaths. The modular units lend themselves to continuous car-type muffle furnaces, or ovens, by providing a gap in the perimeter of the firebricks, which are compressed at their juxtaposed edges by suitable spring-loaded sheathing to permit the travel of the furnace conveyor components at said gap relative to the main fixed portion of the furnace housing.

3,665,871

INCINERATOR TYPE ENVIRONMENTAL CONTROL SYSTEM

William H. Schwartz, Jr., and Billy D. Maxwell, both of Gary, Ind., assignors to Environmental Corporation

Filed June 17, 1970, Ser. No. 46,937
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 C **20 Claims**



A relatively small and compact system for cleaning and purifying products of combustion resulting from incineration of waste materials including smoke and particles suspended therein as well as gases produced thereby wherein all of the products of combustion are forced from a first burning chamber into a balanced flow system including a second burning chamber having a burner flame completely enveloping the input thereto for incinerating the smoke etc. to a substantially clean, hot exhaust gas.

The extremely hot exhaust gases are fed into a temperature reduction labyrinth having several direction changes while maintaining the constant volumetric flow therethrough and finally through a scrubbing stage including a water bath, a series of water sprays and an output baffle while still maintaining the constant volumetric flow for completely removing any other products remaining in the exhaust gases thereby reducing air pollution to substantially a zero level.

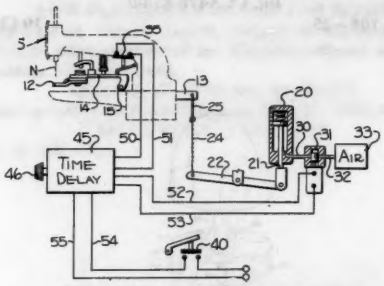
3,665,872

CYCLE CONTROL MEANS FOR SEWING MACHINES

Howard A. Hodgins, Newark, Del., assignor to Enterprise Machine and Development Corp., New Castle County, Del.

Filed Sept. 21, 1970, Ser. No. 73,704
Int. Cl. D05b *69/20*
U.S. Cl. 112—67 **4 Claims**

A time delay is provided between the end of one sewing cycle and the beginning of the next sewing cycle to provide a sufficient delay between sewing cycles that the operator can reposition the article being sewn. The time delay may be adjusted to suit the skill of the operator and a machine-operated switch automatically energizes a time delay relay upon the completion of a sewing cycle.

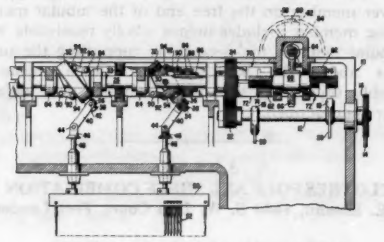


3,665,873

ADJUSTABLE STROKE MECHANISM FOR TUFTING MACHINES

Bernard H. Wittler, Rossville, Ga., assignor to The Singer Company, New York, N.Y.

Filed July 17, 1970, Ser. No. 55,866
Int. Cl. D05c *15/20*
U.S. Cl. 112—79 A **11 Claims**



This disclosure relates to tufting machines and, in particular, to an adjustable stroke mechanism for the needle mechanism of said machine which includes a nutating motion device for driving the needle mechanism and control means for varying the movement of the nutating motion device for changing the stroke of said needle mechanism.

3,665,874

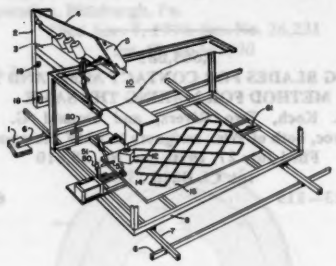
DRIFT COMPENSATING MEANS FOR A QUILTING MACHINE

David R. Cash, Louisville, Ky., assignor to James Cash Machine Co., Louisville, Ky.

Filed Dec. 29, 1970, Ser. No. 102,405
Int. Cl. D05b *11/00, 35/00*
U.S. Cl. 112—118 **12 Claims**

In a quilting machine — of the type wherein a frame-mounted follower drives a carriage-mounted guide-track to move a carriage-mounted quilt assembly along a given path reproducing a given sewing line design while frame-mounted sewing means sews that design into the quilt — a drift correcting means is provided for shifting the track-supporting carriage relative to the track in the direction necessary, and

in an amount sufficient, to correct or compensate for the pull-induced drift of the quilt assembly [relative to the car-



riage on which it is mounted] and thereby make the beginning and end points of the line of sewing coincide.

3,665,875

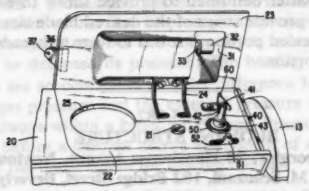
COVER FOR SEWING MACHINE BOBBIN WINDER

Louis J. Bantor, Edison, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jan. 7, 1971, Ser. No. 104,711

Int. Cl. B65h *54/18*

U.S. Cl. 112—218 A **3 Claims**



A bobbin winder for a sewing machine with portions including a bobbin accommodating spindle projecting exteriorly of a sewing machine casing and cooperating with a hinged lid having a spool pin supporting standard which is formed with an interior cavity overlying the exteriorly projecting portions of the bobbin winder in the closed position of the bed.

3,665,876

CONTROL DEVICE FOR FIXED POINT STOP MECHANISM FOR SEWING NEEDLE

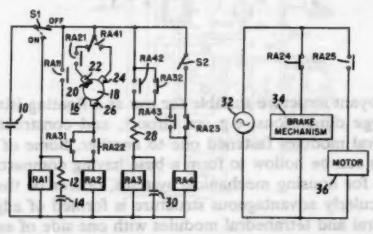
Takanori Kobayashi, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1970, Ser. No. 86,693

Claims priority, application Japan, Nov. 6, 1969, 44/88988

Int. Cl. D05b *69/22*

U.S. Cl. 112—219 A **2 Claims**



The control device for fixed point stop mechanism employs several relays having a time delay element capable of putting a position detector which it to stop a sewing needle at a predetermined position in its active state only when required. When not required the position detector is put in inactive state by the relays.

3,665,877

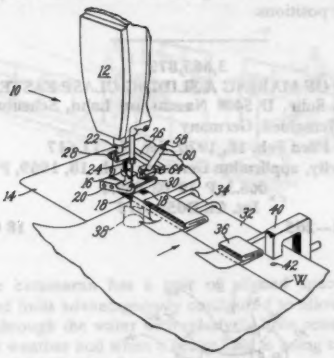
WORK FEEDING MEANS FOR SEWING MACHINES

Francis A. Wickers, Beverly; David W. France, West Newbury, and Ronald C. Mason, Hamilton, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Sept. 14, 1970, Ser. No. 71,647

Int. Cl. D05b *29/00*

U.S. Cl. 112—235 **5 Claims**



For enabling a presser foot more effectively to cooperate with work feeding means such as a conventional dog, an auxiliary presser engageable with the presser foot is automatically actuated, at least for an initial portion of a sewing run, to cause the work to be uniformly fed to the needle of a sewing machine. The auxiliary pressure is attachable to most sewing machines and, while operable on single ply work, is likely to have particular advantage in feeding irregular or bulky items such as hems, binding, trimming or the like.

3,665,878

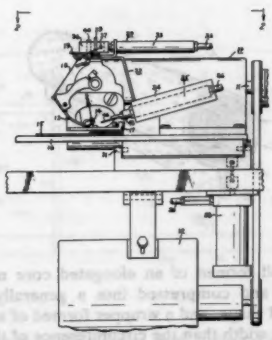
THREAD TRIMMER FOR BLIND STITCH SEWING MACHINE

John Koschoff, Centralia; Kenneth C. Haas, Mohnton, and Robert F. Pettit, Reading, all of Pa., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Dec. 18, 1970, Ser. No. 99,590

Int. Cl. D05b *65/02*

U.S. Cl. 112—252 **10 Claims**



A thread trimmer for a blind stitch sewing machine used in conjunction with a needle positioning mechanism, the thread

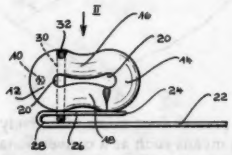
trimmer utilizing a reciprocating thread puller/clamp and reciprocating cutter blade simultaneously actuated by the pistons of single acting air cylinders under the control of a foot operated electrical switch, the thread puller/clamp completing its function prior to actual severance of the thread by the cutter. The sewing machine bed plate is automatically dropped by an air cylinder just after trimming completion to clear the bed and permit insertion of new work for stitching, the air cylinder being also actuated by the foot operated electrical switch. Control circuitry interconnects the thread trimmer and needle positioning mechanism to insure that neither trimming nor needle positioning can take place during normal stitching, that trimming cannot take place during needle positioning, and that trimming cannot take place unless the sewing machine needle and looper are in particular positions.

3,665,879

METHOD OF MAKING A SLIDING CLASP FASTENER

Hans-Ulrich Sohr, D 5408 Nassau am Lahn, Scheubachweg Haus Woffenschied, Germany

Filed Feb. 16, 1970, Ser. No. 11,617
Claims priority, application Germany, Feb. 18, 1969, P 19 08 068.3; P 19 08 069.4
Int. Cl. D05b *3/12*
U.S. Cl. 112—265 **18 Claims**



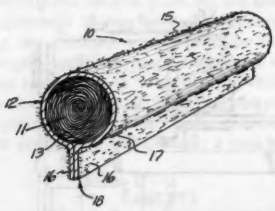
The invention relates to a sliding clasp fastener of the concealed element type comprising series of coupling elements which are, on one side each, sewn on a carrier tape and consist of a thermo-plastics filament wound in the form of a modified helix, as well as carrier tape, which is folded back on itself on the side which is remote from the series of coupling elements.

3,665,880

UPHOLSTERY EDGE ROLL

Jere B. Ambrose, Birmingham, Mich., assignor to Northern Fibre Products Company, Birmingham, Mich.

Filed Aug. 14, 1970, Ser. No. 63,756
Int. Cl. B32b *7/08*
U.S. Cl. 112—417 **1 Claim**



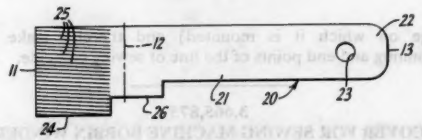
An edge roll formed of an elongated core made of soft paper folded and compressed into a generally cylindrical cross-sectional shape, and a wrapper formed of a narrow ribbon of greater width than the circumference of the core, and made of a thin, non-woven, hairy, synthetic plastic yarn fabric, with the wrapper closely surrounding the core and having its opposite long edge portions bent into face to face contact and extending radially to the core, with a line of stitches arranged parallel to and closely adjacent to the core, securing said edge portions together to form an attaching flange.

3,665,881

SPRING BLADES FOR CONTACT ARMS AND THE METHOD FOR MAKING THE SAME

Claude V. Koch, Two Rivers, and Donald G. Storms, Manitowoc, both of Wis., assignors to AMF Incorporated

Filed July 27, 1970, Ser. No. 58,610
Int. Cl. B21d *53/00*
U.S. Cl. 113—119 **6 Claims**



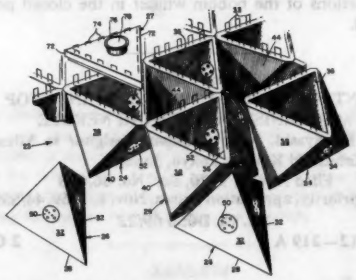
The disclosure is directed to a method of fabricating spring contact arm blades. A sheet of material is annealed on one side and thereafter deformed to provide screw threads. The sheet is cut to provide strips of the desired blade size and the deformed annealed portion is rolled to form a threaded tubular terminal portion.

3,665,882

BUOYANT STRUCTURE

Tancho D. Georgiev, 78 Hawthorne Avenue, Newton, Mass., and Robert M. Scanzani, 182 Bridge Street, Beverly, Mass.

Filed Mar. 16, 1970, Ser. No. 19,928
Int. Cl. B63b *35/00*, *35/44*
U.S. Cl. 114—0.5 F **22 Claims**



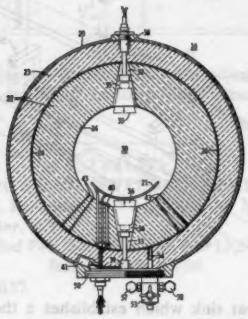
A buoyant structure suitable for use as a floating island of very large dimensions, e.g. an airport, and constructed of polyhedral modules fastened one to another. Some of these modules can be hollow to form a base having compartments suitable for housing mechanical systems, offices or the like. A particularly advantageous structure is formed of adjoined octahedral and tetrahedral modules with one side of each of these modules defining a lower plane, and one face of each octahedron defining the upper plane to which a platform is integrally fastened.

3,665,883

FLOTATION APPARATUS

George Sege, Potomac, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1970, Ser. No. 26,231
Int. Cl. B63g 8/00
U.S. Cl. 114—16 E 9 Claims



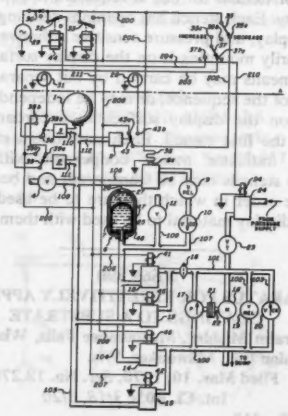
A spherical pressure vessel, to add buoyancy to a submersible vehicle, is designed to withstand a fraction of the maximum ambient sea pressure to be encountered. The sphere is filled with a pressurized gas and as the vehicle descends the gas is heated to increase its pressure in proportion to the absolute temperature. As the submersible ascends, the gas is cooled to decrease its pressure. The heating and cooling of the gas are so controlled that the difference between the internal gas pressure and the external pressure of the ambient sea is always within a broad safe range. Pressurization of the sphere before a descent allows attainment of a certain depth without the requirement for heating the gas.

3,665,884

SUBMERSIBLE VEHICLE BUOYANCY CONTROL

Roy H. J. A. Gustafson, Sea Cliff, N.Y., assignor to Sperry Rand Corporation

Filed Sept. 18, 1970, Ser. No. 73,276
Int. Cl. B63g 8/00
U.S. Cl. 114—16 E 11 Claims



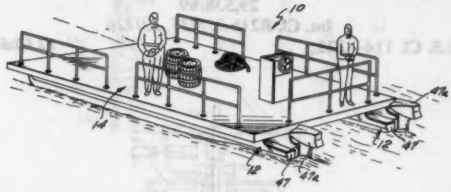
A fail-safe electro-hydraulic control system varies the buoyancy of a submersible vehicle to facilitate variation of the vehicle's operating depth by independent propulsion apparatus. A closed-loop hydraulic circuit determines the proper degree of water ballast storage, simultaneously storing energy in a pressure tank for direct rapid fail-safe restoration of buoyancy to the vehicle in the vent of a system failure.

3,665,885

CATAMARAN

Arthur Javes, Norwalk, Conn., assignor to Sea and Air Inc., Norwalk, Conn.

Filed Nov. 2, 1970, Ser. No. 86,037
Int. Cl. B63b 1/10
U.S. Cl. 114—61 10 Claims



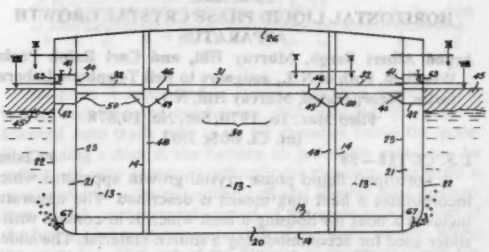
The catamaran has a pair of aligned spaced integrally formed hulls advantageously configured to allow the hulls to pass through the water with relatively little resistance during heavy weather and when a heavy load is being carried by the catamaran. Each of the hulls has a lower bow curving progressively upwardly toward the heads of the hulls and terminating below the top of the hulls. An upper bow advantageously extends above and beyond the lower bow and an upwardly extending downwardly facing generally flat chine is formed between the upper and lower bows. The hulls are bridged and supported in fixed relative positions by a plurality of releasably mounted deck panels forming a flat deck surface providing a convenient working area for pollution control equipment and workers. Releasable fasteners connect the light weight hulls to the flat deck panels and connect the adjacent panels to form a rigid flat deck.

3,665,886

SHIP CONSTRUCTION

William H. German, 20180 Lakeshore Road, Baie D'Urfe, Quebec, Canada

Filed Feb. 25, 1970, Ser. No. 14,076
Int. Cl. B63b 25/02
U.S. Cl. 114—73 5 Claims



A hull of the bulk carrier type is strengthened for arctic service by beams extending along each side of the cargo carrying portion of the vessel approximately at the load water line. Struts extend transversely across the hull at spaced in-

tervals to interconnect the beams and resist external ice pressures. The beams are also used as ducts to convey heated water for heating the hull in the vicinity of the water line. Some of this heated water can be discharged down the outside of the hull from a location somewhat above the load water line.

3,665,887

APPARATUS FOR FEEDING A CABLE THROUGH AN APERTURE IN A BULKHEAD SEPARATING TWO LIQUIDS AT DIFFERENT PRESSURES

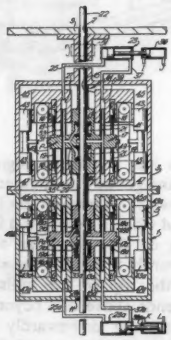
Nicolas Worthing, London, England, assignor to Harland Simon Limited, Bletchley Buckinghamshire, England

Filed June 11, 1970, Ser. No. 45,424

Claims priority, application Great Britain, June 11, 1969, 29,538/69

Int. Cl. B21b *33/035, 33/126*

U.S. Cl. 114—221 **12 Claims**



Apparatus for forcing an insulated cable through an aperture in a bulkhead separating two fluids at different pressures comprising a pair of independently reciprocatable elements, means to cause said elements selectively to grip the cable and at the same time to form a seal around the cable, the arrangement being such that while one element grips and moves the cable in the required direction through the bulkhead, the other element is returning with its grip released to take up a position ready to grip the cable again and to continue its movement before the said one element releases the cable to return to begin another cycle, and means surrounding and in sealing engagement with the elements, said means being in sealing engagement around said aperture to separate the fluid from the other fluid.

3,665,888

HORIZONTAL LIQUID PHASE CRYSTAL GROWTH APPARATUS

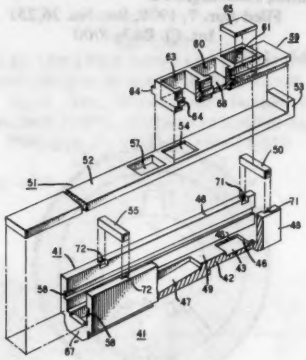
Arpad Albert Bergh, Murray Hill, and Carl Ralph Paola, Westfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 16, 1970, Ser. No. 19,878

Int. Cl. B05c *3/02*

U.S. Cl. 118—58 **4 Claims**

A horizontal liquid phase crystal growth apparatus which incorporates a heat sink means is described. The apparatus includes a boat for housing a melt which is in contact with a slider used for accommodating a source material. The slider, in turn, is in contact with a pedestal used for holding a substrate. The melt and the substrate are isolated from one another at different stages of the growth process by means of the slider. In operation, the boat is heated to a growth temperature and the slider is then moved so as to effect saturation of the melt with the source material. The slider is then moved again to contact the substrate with the source-saturated melt. Growth is then initiated from a convection-free melt by cooling the pedestal and, thus, the substrate by



means of a heat sink which establishes a thermal gradient along the vertical axis of the container.

3,665,889

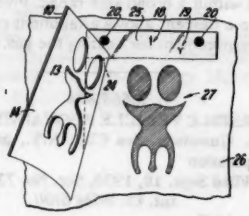
STENCILS FOR PRODUCING COMPOSITE DISPLAY

Anita Wagenvoord, 308 East 94th Street, New York, N.Y.

Filed Jan. 18, 1971, Ser. No. 107,320

Int. Cl. B05c *15/04*

U.S. Cl. 118—505 **10 Claims**



A series of stencils for use in sequence to produce a composite display. Each stencil has openings defining a portion of the total display, and pressure sensitive adhesive on one face for temporarily mounting it on the display surface. Registration guide means may be carried by but separable from the first stencil of the sequence, or may be independent elements positioned on the display surface in accordance with the position of the first stencil. Each subsequent stencil carries registration indicator means cooperable with the guide means. The stencils may be transparent and bear indicia indicating the order in which they are to be used and the nature of the display material to be used with them.

3,665,890

APPARATUS FOR REPETITIVELY APPLYING COATINGS TO A SUBSTRATE

Ralph Ephraim Mishler, Menomonee Falls, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

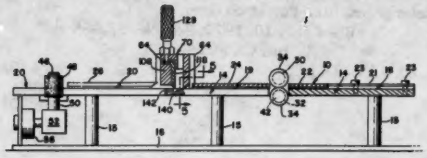
Filed Mar. 10, 1970, Ser. No. 18,278

Int. Cl. B05c *3/18, 3/20*

U.S. Cl. 118—412 **10 Claims**

An apparatus for repetitively striping the surface of a dielectric substrate with two or more micro-thin coatings from a single applicator station with each coating of substantially even thickness and interconnected along adjacent

edges, each coating being formed from a flowable viscous plastic material having a dispersion of particles therein that exhibit discrete electrical properties so that there is formed a



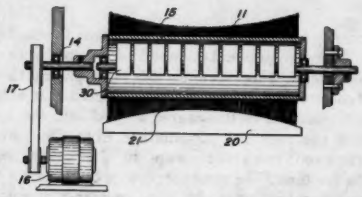
thin line overlapped junction between adjacent edges with the junction providing uniform and improved electrical characteristics.

3,665,891

MAGNETIC BRUSH DEVELOPMENT APPARATUS

Carl R. Pitasi, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 24, 1970, Ser. No. 13,543
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **12 Claims**



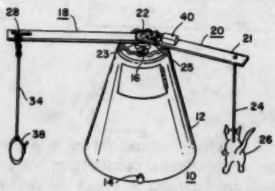
An apparatus for developing a latent electrostatic image with developer material wherein development is effected by utilizing a rotating magnetic brush mechanism. The axis of rotation of the magnetic brush extends in a skewed relationship with respect to the axis of rotation of the image bearing surface. The developer material attracted to the magnetic brush is doctored to form a concave outer surface of developer on the member for effective development of the latent image without streaking. Alternatively, the magnetic member carrying developer possesses a concave-like exterior surface to transport developer into uniform stroking contact with the image bearing surface similarly to prevent streaking defects in the developed image. Similarly the magnetic field of the brush may be shaped so as to be weakest in the middle of the brush creating, automatically, a concave shaped surface of developer.

3,665,892

EXERCISER FOR ANIMALS

Ike W. Kusisto, P.O. Box 13237, Phoenix, Ariz.

Filed Oct. 30, 1970, Ser. No. 85,461
Int. Cl. A01k *15/00*
U.S. Cl. 119—29 **7 Claims**



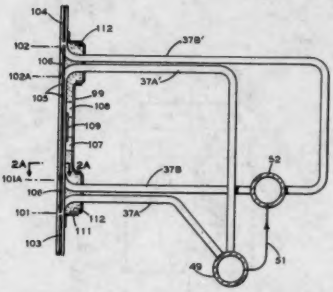
An improved exerciser for animals such as dogs including a means movable in unison with the dog for stimulating his activity.

3,665,893

VAPOR GENERATOR TUBE ARRANGEMENT

Carl Lieb Barberton, and Murray Wiener, both of Akron, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Dec. 29, 1970, Ser. No. 102,346
Int. Cl. F22b *37/24*
U.S. Cl. 122—6 A **14 Claims**



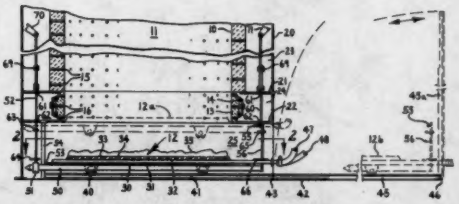
A forced flow vapor generator wherein at least one of the upright boundary walls of the furnace has a lower and upper section formed of a first and second group of parallel flow tubes respectively, the tubes in each group being rigidly united throughout most of their lengths and having portions thereof interlaced and coextensive with each other, the interlaced portions being detached from one another for the most part. Provisions for interconnecting the tubes of the first and second groups including having inlet and outlet portions of the tubes bent out of the plane of the wall, the bent out portions being detached from one another for the most part.

3,665,894

ROLL OUT FURNACE GRATE

Allen J. Jones, Fall Creek, Oreg., assignor to Michel Lumber Company, Lake Oswego, Oreg.

Filed Nov. 9, 1970, Ser. No. 87,806
Int. Cl. F23h *3/04*
U.S. Cl. 122—374 **8 Claims**

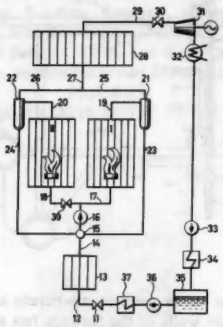


The grate is supported in raised, operative position by a raising and lowering mechanism. For cleaning, the grate is lowered onto track rails in an air chamber below the grate. By opening a door in the furnace air jacket the grate may be pulled out onto exterior track rails for cleaning. The grate is equipped with a water cooling coil and flexible hose connections which accommodate travel of the grate into and out of the furnace without disconnection of the water supply. When the grate is pulled out of the furnace it disengages from the raising and lowering mechanism and when rolled back into the furnace it reengages with the raising and lowering mechanism and is lifted to operative position. Instead of cleaning the grate immediately and returning it to the furnace, it may be replaced with a cleaned grate in order to get the furnace back into operation more quickly.

3,665,895
PROCESS FOR VARIABLE-PRESSURE OPERATION OF A FORCED-FLOW VAPOR GENERATOR

Josef Sauter, Sulgen, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Dec. 7, 1970, Ser. No. 95,453
Claims priority, application Switzerland, Dec. 12, 1969, 18501/69
Int. Cl. F22b *35/14*
U.S. Cl. 122—406 ST 6 Claims

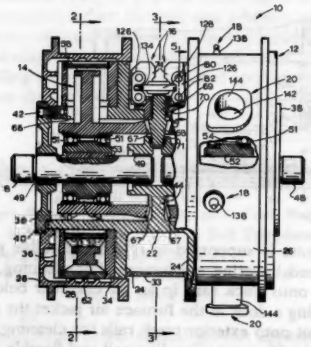


The enthalpies of the working mediums leaving the respective evaporators in the plant are maintained at a difference of at least 30 kcal/kg when the load approaches or exceeds the critical pressure range. The working medium fed to the downstream heating surfaces is drawn chiefly from the evaporator having the highest enthalpy while the working medium which is recirculated is drawn chiefly from the evaporator having the lowest enthalpy.

3,665,896
TWO-CYCLE ENGINE

Robert Crehore, 414 East Frye Avenue, Peoria, Ill.

Filed May 13, 1971, Ser. No. 143,100
Int. Cl. F02b *53/00*
U.S. Cl. 123—18 A 12 Claims

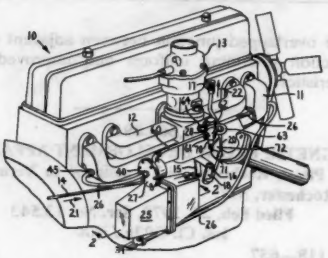


A two-cycle engine having banks of arcuately reciprocating pistons interconnected such that the banks of pistons move in opposite arcuate reciprocating directions, and including novel fuel vapor inlet and exhaust valve means adapted for employment of hydrogen and oxygen input vapor gases whereby to substantially eliminate exhaust air pollutants.

3,665,897
STEAM INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINE

Oscar E. Boyer, Portland, Oreg., assignor to Boyer & Abbott Enterprises, Inc., Portland, Oreg.

Filed July 10, 1970, Ser. No. 53,805
Int. Cl. F02d *19/00*
U.S. Cl. 123—25 B 4 Claims

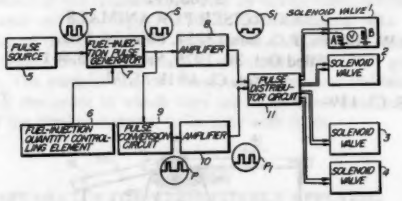


A steam generating tube is mounted in the exhaust manifold of the engine and supplied with water from a water tank. Wet steam generated in the tube passes through a steam separator and substantially dry steam is injected into the intake manifold of the engine to pass into the cylinders along with the fuel and air mixture from the carburetor. Water removed from the steam in the steam separator returns to the tank. The steam separator comprises a housing filled with stainless steel shavings, one end of said steam generating tube being connected with said housing. A tube to a steam control valve is connected to the top of said housing and a water return tube in the bottom of said housing is connected with said tank.

3,665,898
DRIVING DEVICE FOR FUEL INJECTION SOLENOID VALVES

Isezi Kamazuka, Kariya-shi, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan

Filed Dec. 16, 1969, Ser. No. 885,470
Claims priority, application Japan, Dec. 24, 1968, 43/94839; Jan. 16, 1969, 44/3054
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA 2 Claims

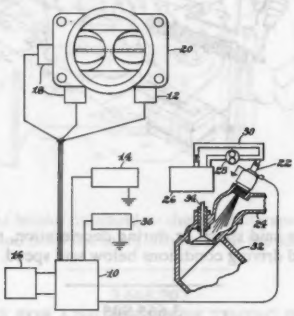


A driving system for solenoid valves in an electrical fuel injection system of an internal combustion engine, wherein said solenoid valves are adapted to inject the fuel into the engine cylinders upon application thereto of a fuel injection pulse synchronized with the valve opening timing of the air intake valves in the internal combustion engine and having a pulse width corresponding to the load of the engine and the like.

3,665,899
CIRCUIT FOR AIDING THE COLLAPSE OF AN ELECTROMAGNETIC FIELD

John R. Nagy, Detroit, Mich., assignor to The Bendix Corporation

Filed Sept. 21, 1970, Ser. No. 74,057
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA 2 Claims

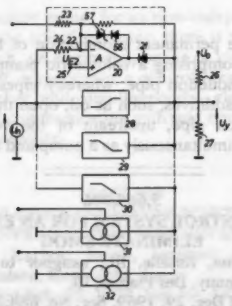


A circuit means is disclosed for aiding the collapse of an electromagnetic field in order to remove energy stored therein and thus to hasten movement of a movable member whose position is controlled by the strength of the electromagnetic field. In particular, an electronic device is used to provide a repeatable, uniform, rapid, controlled energy dissipating circuit path. By dissipating the energy stored in the electromagnetic field through a zener diode, uniformity of field collapse is assured, good repeatability is provided and actuation frequency of the field is increased.

3,665,900
ELECTRONIC CONTROL SYSTEM FOR SHAPING THE FUEL-SPEED CHARACTERISTICS OF AN INTERNAL COMBUSTION ENGINE

Ewald Schlimme, Hildesheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation-in-part of application Ser. No. 867,025, Oct. 16, 1969. This application Oct. 30, 1969, Ser. No. 872,674
Claims priority, application Germany, Nov. 7, 1968, P 18 07 539.3
Int. Cl. F02b *3/00*; F02m *39/00*
U.S. Cl. 123—32 EA 17 Claims

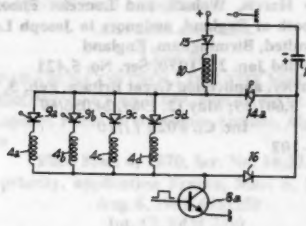


Additional amplifiers are connected in parallel to the high gain direct current amplifier of the parent application. These have a very high output impedance compared to the output impedance of the direct current amplifier. All amplifier outputs are connected to a voltage divider tap from which the fuel control signal is derived. The additional amplifiers have inherent temperature compensation and shape the full-load limiting line, while the original high gain direct current amplifier shapes the speed control lines.

3,665,901
SYSTEM CONTROLLING THE SPEEDY ENERGIZATION OF ELECTROMAGNETS, CHIEFLY THOSE CONTROLLING THE OPENING OF ELECTROMAGNETIC INJECTORS IN INTERNAL COMBUSTION ENGINES

Louis A. Monpetit, L'Etang-la-Ville, and Pierre M. Advenier, Paris, both of France, assignors to Societe des Procedes Modernes d'Injection Sopromi, Les Mureaux, France

Filed Dec. 23, 1969, Ser. No. 887,487
Claims priority, application France, Dec. 27, 1968, 181114; Apr. 18, 1969, 6912153; June 13, 1969, 6919657; Aug. 14, 1969, 6928097
Int. Cl. F02b *3/00*; H01h *47/24*
U.S. Cl. 123—32 EA 22 Claims



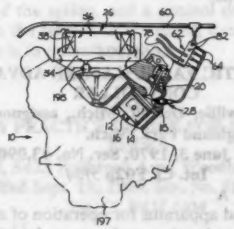
System controlling the speedy energization of electromagnets, chiefly those controlling the opening of electromagnetic injectors in internal combustion engines.

An arrangement intended chiefly for the energization of electromagnetic solenoids for operating fuel injectors of internal combustion engines wherein the means for energizing the electromagnetic solenoids in the desired sequence receive control signals periodically and at the same frequency as an induction coil fed by the same power supply as said solenoids. The magnetic energy generated in the solenoids and in the induction coil upon termination of the control signals is stored in means such as one or more condensers so as to be recovered for rapidly energizing the proper electromagnetic solenoid for the next injector operation.

3,665,902
STRATFIELD-CHARGE ENGINE AND FUEL IGNITION-INJECTION PLUG THEREFOR

John J. Bloomfield, 222 South Sunset Canyon Dr., Burbank, Calif.

Filed Dec. 24, 1969, Ser. No. 887,941
Int. Cl. F02p *13/02*
U.S. Cl. 123—32 ST 10 Claims



A stratified-charge spark ignition engine. The engine has cylinder intake ports which effectively open directly to at-

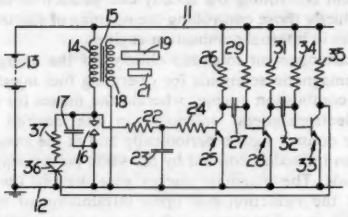
mosphere, such that unheated and unthrottled fuel free air is drawn into the cylinders during intake, and a novel throttle controlled compression actuated fuel injection and ignition system which injects a metered quantity of atomized fuel directly into the spark region of each cylinder immediately prior to firing to provide within the region at the instant of firing a highly combustible stratified fuel charge. The fuel injection-ignition system embodies novel fuel injection-ignition units for the cylinders which serve the dual function of throttle controlled, compression actuated fuel metering pumps for injecting fuel into the cylinder spark regions and spark plugs for igniting the fuel. In their preferred configuration, these injection-ignition units resemble and are designed to replace the spark plugs of a conventional gasoline engine to permit conversion of the latter to a stratified-charge engine with minimum modification and cost.

3,665,903

SPEED LIMITING SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Paul Anthony Harris, Walsall, and Lancelot Phoenix, Birmingham, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 23, 1970, Ser. No. 5,421
Claims priority, application Great Britain, Feb. 3, 1969, 5,607/69; May 12, 1969, 24,056/69
Int. Cl. F02d *11/10*
U.S. Cl. 123—102 **1 Claim**



A speed limiting system for an internal combustion engine includes timing means for measuring the interval between successive openings of a contact breaker or other switching device which is turned on and off in timed relationship to the engine to control the production of sparks at the plugs of the engine. A thyristor is operable by the timing means when the interval between successive openings of the switch device falls below a predetermined minimum value for preventing production of sparks.

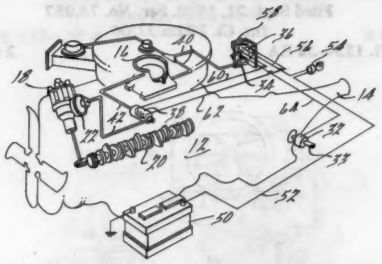
3,665,904

AUTOMATIC VACUUM SPARK ADVANCE CONTROLLER

Richard E. Goodwillie, Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed June 3, 1970, Ser. No. 43,090
Int. Cl. F02p *5/04*
U.S. Cl. 123—117 A **8 Claims**

A method of and apparatus for operation of an automotive vehicle internal combustion engine to reduce exhaust emissions thereof by disabling the engine vacuum spark advance control in response to and over a range of engine vacuum levels existing at or corresponding to medium to light vehicle acceleration loads up to a predetermined vehicle speed and restoring or enabling the normal vacuum spark advance control of the distributor when the vehicle is operated in any mode above said speed or during deceleration, steady speed or road load driving conditions below said speed.

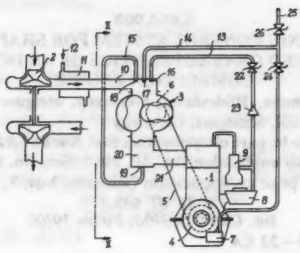


3,665,905

FUMIGATION DEVICES FOR SUPERCHARGED DIESEL ENGINES

Maurice G. Brille, and Yves-Marie E. Baguelin, both of Suresnes, France, assignors to Societe Anonyme de Vehicules Industriels et d'Equipments Mecaniques Saviem, Suresnes, France

Filed June 18, 1970, Ser. No. 47,331
Claims priority, application France, June 26, 1969, 6921520
Int. Cl. F02b *37/04*
U.S. Cl. 123—119 C **6 Claims**



Device for the permanent atomization of liquid fuel into Diesel engines comprising a volumetric pump interposed in the engine air induction pipe, whereby pipes for delivering liquid fuels and additives, such as oil, open through jets into said air induction pipe, upstream of the volumetric gear pump operated simultaneously as a pump and as an atomizer.

3,665,906

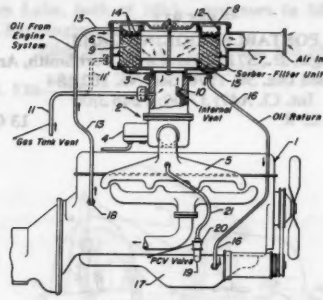
VAPOR CONTROL SYSTEM FOR AN ENGINE TO ELIMINATE SMOG

Ted V. De Palma, Roselle, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 29, 1969, Ser. No. 888,259
Int. Cl. F02m *59/00*
U.S. Cl. 123—136 **3 Claims**

A vapor absorption system for an internal combustion engine provides for a replenishing flow of oil to coat an absorber unit so as to keep a high efficiency operation. A desired oil flow to the evaporation control unit may be a por-

tion of the oil from the engine crankcase lubrication system which, in turn, includes a crankcase ventilation valve in a line



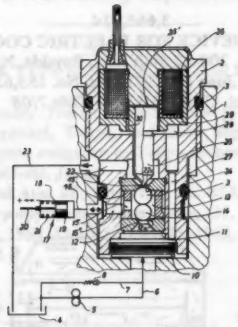
to the engine intake manifold so that sorbed vapors are effectively removed from the oil returning from the sorption unit.

3,665,907

DEVICE FOR ADJUSTING THE TIMING IN FUEL INJECTION PUMPS

Helmut Laufer, Stuttgart-Botnang, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 13, 1970, Ser. No. 27,767
Claims priority, application Germany, Apr. 22, 1969, P 19 20 274.5
Int. Cl. F02m *39/00*; F02b *3/00*
U.S. Cl. 123—139 E **6 Claims**



In a fuel injection pump, for an rpm-independent, arbitrary adjustment of the injection timing, there is provided an electromagnet which, on command, opens or closes a conduit to admit or cut off, respectively, a control pressure affecting an adjusting member and simultaneously, closes or opens a bypass channel communicating with said conduit upstream of said adjusting member.

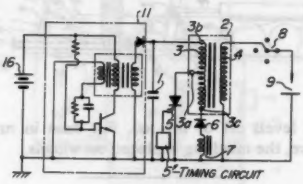
3,665,908

CAPACITOR DISCHARGE TYPE IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazuo Oishi, Kariya, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan

Filed Feb. 27, 1970, Ser. No. 14,969
Claims priority, application Japan, Apr. 11, 1969, 44/28535; Apr. 12, 1969, 44/28405
Int. Cl. F02p *3/06*
U.S. Cl. 123—148 E **2 Claims**

A capacitor discharge type ignition system for internal combustion engines comprising an ignition coil whose primary winding is connected at one end thereof to one terminal of a discharge capacitor, has an intermediate tap connected through a switching element to the other terminal of the capacitor, and is connected at the other end thereof to the



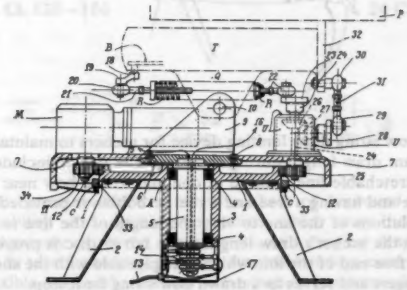
aforesaid other terminal of the capacitor through a diode inserted in the polarity opposite to that of the switching element or a series circuit consisting of a diode of the above-mentioned polarity and a choke coil.

3,665,909

APPARATUS CONTROLLING THE MECHANISM THROWING CLAY TARGETS IN BALL TRAPS

Pierre Laporte, Ponte de la Brogue, Antibec, Alpes Maritimes, France

Filed Mar. 4, 1970, Ser. No. 16,321
Claims priority, application France, Mar. 6, 1969, 6906183; Aug. 6, 1967, 6921259
Int. Cl. F41f *7/00*
U.S. Cl. 124—9 **2 Claims**



A target-throwing apparatus comprises a frame, a turret mounted for rotational movement on the frame, a swinging throwing arm carried by a support tiltably mounted on the turret, an energy-storing spring to swing the throwing arm, and mechanical connections which adjust the azimuth of the turret, the inclination of the tiltable support and the tension of the spring. A motor activates the connection which adjusts the tension of the spring, and a control device activates the motor so that the tension of the spring can be adjusted while the apparatus is in operation.

3,665,910

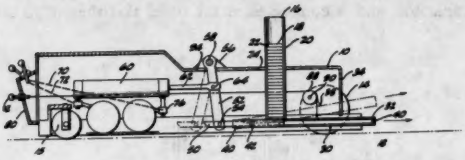
HOCKEY PRACTICE DEVICE FOR PROPELLING PUCKS

Orlando Boni, 5423 Fallbrook Ave., Woodland Hills, Calif.

Filed Sept. 19, 1969, Ser. No. 859,343
Int. Cl. F41f *1/04*
U.S. Cl. 124—11 **5 Claims**

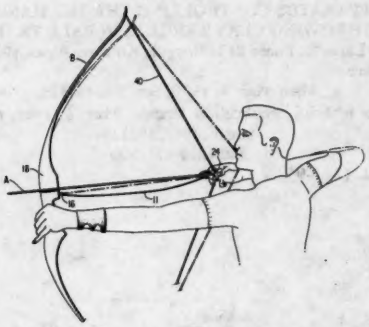
A machine for automatically shooting or propelling a hockey puck is described. The machine includes apparatus for automatically issuing a hockey puck from a hopper. The puck is then dropped into an aiming chute from which it is

propelled by a piston driven hammer. The aiming chute is adapted to be raised or lowered to propel the puck therefrom



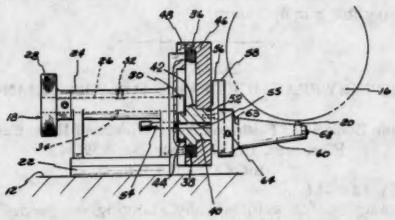
at different levels off of the ice. For ease in maneuvering across the ice, the machine is placed on wheels.

3,665,911
ARCHERY BOW STRING RELEASE TAB AND DRAW LIMITING DEVICE
Anthony L. Altier, Honesdale, Pa.
Filed Oct. 6, 1969, Ser. No. 864,143
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 **9 Claims**



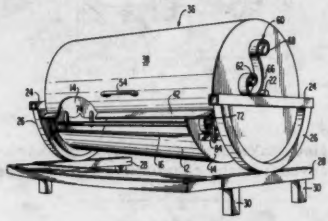
A bow string draw limiting device for archers to maintain a constant draw length during shooting. The device includes a non-stretchable line secured at one end to the bow near the handle and having a free end a reel or bobbin is provided for convolutions of the line to vary the length of the line to adjust to the archer's draw length a slip tab or disc is provided at the free end of the line which is engageable with the shooting fingers and serves as a drawn bow string limit stop.

3,665,912
HYPOCYCLIC WHEEL DRESSER
John W. Conforti, Detroit, and Joseph Silvagi, Warren, both of Mich., assignors to Camdale Enterprises, Roseville, Mich.
Filed Aug. 22, 1969, Ser. No. 852,267
Int. Cl. B24b *53/08*
U.S. Cl. 125—11 AT **11 Claims**



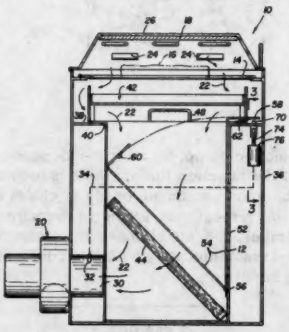
A diamond tool for dressing a grinding wheel is supported by a fixture for motion along a path having a curvature that can be reversed for generating either a convex or a concave wheel profile, and a radius of curvature that can be increased to infinity for generating a linear profile.

3,665,913
PORTABLE COOKING GRILL
Bunyam B. Cagle, Jr., 5711 Grand Ave., Fort Smith, Ark.
Filed Dec. 30, 1970, Ser. No. 102,684
Int. Cl. A47j *37/00;* **F24b** *3/00*
U.S. Cl. 126—25 R **13 Claims**



A portable charcoal cooking grill comprising a generally half-cylindrical open-topped firebox is surmounted by a generally half-cylindrical cover which is rotatable on the firebox axially to adjusted degrees of opening settable by cam means cooperating between the firebox and cover so as to regulate the rate of air supply to burning fuel beneath a grate which is similarly cam-supported and vertically adjustable in the firebox.

3,665,914
FIRE SAFETY DEVICE FOR ELECTRIC COOKING UNIT
Victor M. Berger, 200-17 50th Ave., Bayside, N.Y.
Filed June 16, 1971, Ser. No. 153,634
Int. Cl. A47j *37/06;* **F24c** *7/08*
U.S. Cl. 126—41 R **2 Claims**

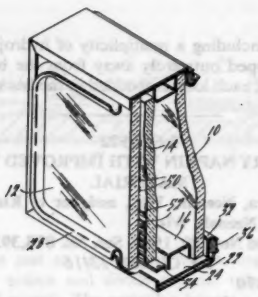


An electric cooking unit with a down-draft induced air flow in which the fire hazard potential of the air flow is effectively minimized by a closure member which, in its closed position, terminates the air flow. The closure member is arranged in a removable container of the unit which does not interfere with achieving the aforesaid safety feature, and yet also permits the container to be readily transported to a remote washing station to thereby facilitate cleaning the cooking unit.

3,665,915
OVEN DOOR WINDOW UNIT FOR SELF-CLEANING OVENS

Joseph W. Katona, Walled Lake, and David W. Crouse, Union Lake, both of Mich., assignors to Mills Products, Inc., Farmington, Mich.

Filed Mar. 18, 1971, Ser. No. 125,557
Int. Cl. F23m 7/00
U.S. Cl. 126—200 8 Claims

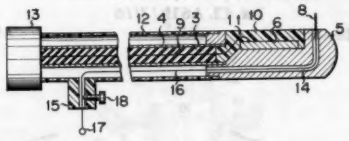


A window unit for a door of a self-cleaning oven has three transparent panes of glass clamped in spaced relation to provide a self-contained unit to be mounted in the window opening of an oven door. The middle pane of glass is elevated by thermostatic means at oven cleaning temperatures, and strips of heat reflecting material on the middle and outer panes of glass permit viewing into the oven at temperatures within the cooking range and are arranged to reflect heat as well as block visibility at oven cleaning temperatures.

3,665,916
CATHETER TYPE SEMICONDUCTOR RADIATION DETECTOR

Tetsuji Kobayashi; Tetsuo Sasaki, both of Yokohama-shi; Seiichi Takayanagi, Tokyo, and Toru Sugita, Yokohama-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 28, 1969, Ser. No. 853,638
Claims priority, application Japan, Aug. 31, 1968, 43/75513; Sept. 30, 1968, 43/84156; Oct. 25, 1968, 43/92569
U.S. Cl. 128—2 R 7 Claims



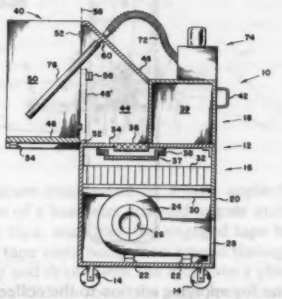
A catheter type semiconductor radiation detector comprising a semiconductor element introduced into a living body for detecting radiation prevailing therein wherein there is provided a movable retractable needle for fixing the detecting element at a prescribed position in the living body.

3,665,917
ENVIRONMENT CONTAMINENT CONTROL CONSOLE

Marcus M. Jensen, 1764 North 1450 East, Provo, Utah

Filed Oct. 1, 1969, Ser. No. 862,747
Int. Cl. A61b 10/00
U.S. Cl. 128—2 R 9 Claims

A console for the collection and containment of airborne contaminants within a given environmental region, particularly as related to the induction of coughing for diagnostic procedures and the control of resultant microbial scatter. This compact and mobile console contains a fan for forcibly drawing air from the environs of the console, through a hood,



a pre-filter and an absolute filter. Doors are hinged upon one side of the cabinet for nesting during storage and to form an air-collecting hood during operational procedures. Means are also provided for dispensing aerosol to a patient through the hood via a disposable tube, to induce coughing in the patient.

3,665,918
CONFORMABLE ADHESIVE SHEET

Julius A. Lindquist, Somerville, and George J. Buese, East Brunswick, both of N.J., assignors to Johnson & Johnson

Filed Jan. 12, 1970, Ser. No. 2,225
Int. Cl. C09j 7/02; A61l 15/06
U.S. Cl. 128—156 24 Claims

This pressure-sensitive adhesive sheet of improved conformability and splitting resistance which may be advantageously employed, for example, as a surgical drape or used in tape form or as part of a surgical bandage comprises a flexible polyurethane foam web which is compressedly set to less than about 50 percent of its original thickness and has a splitting resistance of at least about 20 pounds per square inch, an extent of elasticity of at least about 110 percent and a 100 percent modulus of less than about 5 pounds per inch width. A porous pressure-sensitive adhesive is applied to at least portions of one side of the web and, in certain embodiments, a low-friction coating is applied to the other side. In other embodiments, a release coating which may also have a low coefficient of friction may be applied to enhance unwindability. As a tape, the product is advantageously applied to irregularly shaped portions of the body having varied and changeable conformability requirements, such as joint locations, particularly knuckles, elbows, knees and the like.

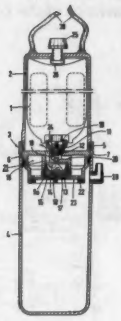
3,665,919
SUCTION APPARATUS

Asmund Sigurd Laerdal, Stavanger, Norway

Filed Nov. 23, 1970, Ser. No. 92,044
Claims priority, application Germany, Apr. 21, 1970, P 20 18 964.4
Int. Cl. A61m 1/00
U.S. Cl. 128—277 12 Claims

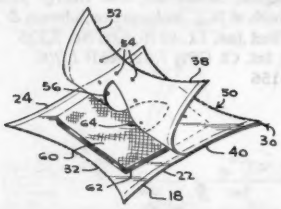
Medical suction apparatus having a container, a collector vessel for receiving secretion from the oral cavity of a pa-

tient, and a jet ejector system fed with gas from a bottle in



the container for applying suction to the collector vessel. The parts can be connected together directly, without tubing.

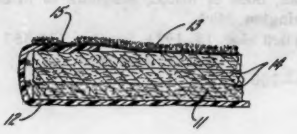
3,665,920
PERINEAL PROTECTOR
Rachel D. Davis, 111 East Gordon St., Kinston, N.C.
Filed Sept. 26, 1969, Ser. No. 861,431
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **14 Claims**



A perineal protector to be worn by humans, particularly incontinent adults, shaped to fit the perineal area and comprised of sheet material having elongated curved sides and curved ends defining a waist area. The perineal protector is preferably formed from a continuous length of sheet material having at the ends scored lines capable of being torn, and a wedge-shaped area formed between and being bound by the ends of adjacent protectors, which wedge-shaped area is removable by tearing along the score lines. An inner layer of liquid-impervious material may be included through which means are provided for fluid communication through the inner layer for admitting fluids from the perineum of a wearer, and between the layers there may be positioned the liquid receiving and retaining material to prevent solids and fluids from passing beyond the protector.

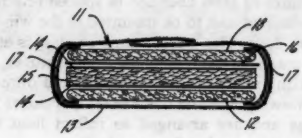
3,665,921
DISPOSABLE DIAPER WITH IMPROVED LINER MATERIAL
Robert J. Stumpf, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Nov. 19, 1969, Ser. No. 877,968
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **10 Claims**

A disposable diaper having a conventional central pad of absorbent material, a conventional layer of fluid impervious material disposed on one side of the central pad and extending around the edges thereof, and an improved liner material disposed on the other side of the central pad and joined to the fluid impervious material around the periphery of the pad. The improved liner material comprises a high-loft, nonwoven fabric having a discontinuous backing layer of flexible



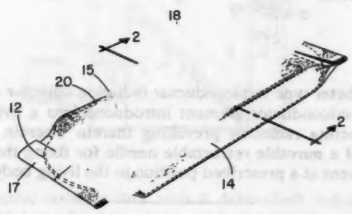
adhesive, and including a multiplicity of hydrophobic fibers individually looped outwardly away from the backing layer with the ends of each loop embedded in the backing layer.

3,665,922
SANITARY NAPKIN WITH IMPROVED WRAP MATERIAL
Robert F. Skora, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Nov. 20, 1969, Ser. No. 878,393
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **9 Claims**



A sanitary napkin having a conventional central pad of absorbent material, and an improved wrap material disposed around the central pad and comprising a high-loft, nonwoven fabric having a discontinuous backing layer of flexible adhesive. The fabric includes a multiplicity of hydrophobic fibers individually looped outwardly from the backing layer with the ends of each loop embedded in the backing layer.

3,665,923
FLUSHABLE SANITARY NAPKIN
John F. Champaigne, Jr., Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 5, 1970, Ser. No. 8,838
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 W **7 Claims**



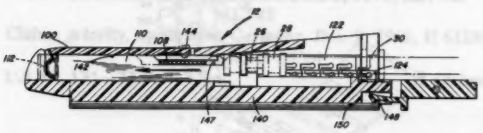
A flushable sanitary napkin with adhesive attachment means. A major portion of the wrapper enclosing the absorbent pad is a non-woven web of fibers held together with a water-dispersible binder. The napkin has no end tabs but is provided on its bottom side with a pressure sensitive adhesive area for attachment to a suitable undergarment for support.

3,665,924

SUTURING AND DIVIDING ORGANIC TUBULAR STRUCTURES

Douglas G. Nolles, New Canaan, and Graham W. Bryan, Ridgefield, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.

Filed Oct. 13, 1970, Ser. No. 80,451
Int. Cl. A61b *17/32, 17/12*
U.S. Cl. 128—305 19 Claims



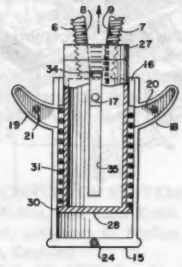
A cartridge and an instrument which, together serve to mechanically suture and divide organic tubular structures, such as blood vessels. The cartridge houses a plurality of staples and operates in three stages. After the tubular structure is inserted between the jaws of the cartridge, the cartridge jaws close, a pair of pushers come forward and suture the organic structure in two spaced locations with a pair of surgical staples, and a blade comes forward and divides the tubular structure at a position intermediate the two staples. The staples are indexed and readied for discharge by means of a pair of leaf springs which act between a fixed rail assembly and a movable wrap assembly. The instrument is adapted to coact with the novel cartridge and depends upon the interaction of three springs to bring about the three-stage operation of the cartridge.

3,665,925

OBSTETRICAL FORCEPS

Hamo M. Dersookian, 7300 Riverdale Rd., Lanham, Md.

Filed Aug. 11, 1970, Ser. No. 62,824
Int. Cl. A61b *17/44;* A61d *1/08;* G01l *5/00*
U.S. Cl. 128—323 19 Claims



An obstetrical forceps wherein the gripping portions or blades are provided with an externally threaded shank or base portion over which is adapted to be threaded a combined tensiometer and hand grip portion to indicate the amount of compressive force and tension applied to the head of a baby during delivery.

3,665,926

LIGATURE AND APPLICATOR THEREFOR

Mary Alice Flores, New Orleans, La., assignor to C. R. Bard, Inc., Glens Falls, N.Y.

Filed Apr. 8, 1970, Ser. No. 26,488
Int. Cl. A61b *17/12, 17/10*
U.S. Cl. 128—326 5 Claims

A vessel ligature constituted by a tape applied around a vessel by means of a hemostat adapted to pass under the vessel, engage the tape, and draw the engaged tape back below the vessel, the tape ends being then passed through an elongated wire loop and drawn with the loop into a plastic sleeve, the sleeve being slidable over the wire loop and along the tape toward the vessel to tighten the bight of the tape around the vessel, and the bight being maintained in vessel-closing position by means of a hemostat clamped on the plastic sleeve and/or tape at a distance from the vessel; and the method including said steps.

3,665,927

IMPREGNATION OF POLYFILAMENTOUS SUTURES WITH SYNTHETIC POLYMER PARTICLES

Leonard D. Kurtz, Woodmere, N.Y., assignor to Sutures, Inc., Coventry, Conn.

Filed May 29, 1968, Ser. No. 732,859. The portion of the term of the patent subsequent to May 30, 1984, has been disclaimed.
Int. Cl. A61l *17/00*
U.S. Cl. 128—335.5 6 Claims

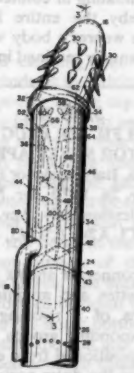
Polyfilamentous sutures having the attributes of a monofilamentous suture are prepared by impregnating the sutures with an aqueous dispersion of inert, synthetic polymeric particles and then subjecting the impregnated suture to centrifugal force to simultaneously extract water and dry the suture.

3,665,928

SELF PROPELLED CATHETER

Louis R. M. Del Guercio, 14 Pryer Lane, Larchmont, N.Y.

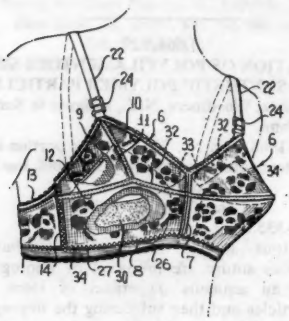
Filed Oct. 6, 1969, Ser. No. 864,141
Int. Cl. A61m *25/00*
U.S. Cl. 128—350 R 15 Claims



A catheter effective for self movement within a passageway comprises an elongated tube having a first chan-

nel extending axially thereof and a member operatively hingedly connected to the forward end of the tube. The member is provided with means such as a plurality of angularly projecting parts for gripping the walls of the passageway. Means are provided to oscillate the member within the passageway so that the projecting parts alternately grip one side wall of the passageway and then another. The oscillating means preferably comprises a fluid system which includes two channels connecting with the channel of the elongated tube, extending forwardly and outwardly therefrom, and provided with openings proximate the oscillating member. When a fluid is forced through the main channel it is directed by fluid control means to enter one and then the other of the laterally extending channels to pressurize different surface parts of the member, thereby to cause the oscillation thereof.

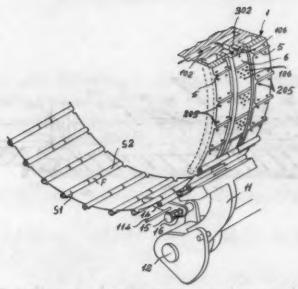
3,665,929
BRASSIERE
Newby O. Brantly, 1104 Rebecca Rd., Frederick, Okla.
Filed May 4, 1970, Ser. No. 34,109
Int. Cl. A41c *3/00*
U.S. Cl. 128—494 **4 Claims**



This disclosure relates to a brassiere of the uplift type which includes a pair of breast cups joined together and having extension panels secured to the remote ends thereof, and cooperating attaching means carried by the remote ends of the extension panels. The brassiere is further provided with a single elastic band extending entirely along the lower edge of the brassiere and terminating in connected relation to the attaching means whereby the entire lower portion of the brassiere snugly fits a wearer's body with lower portions of the breast cups being snugly retained in place.

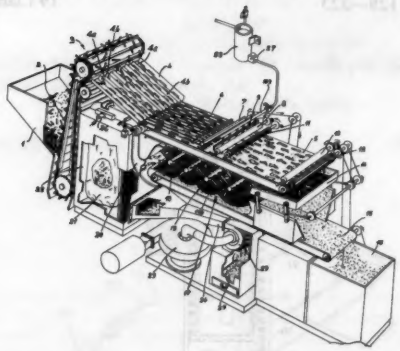
3,665,930
DOUBLE LENGTH FILTER PLUG AND CIGARETTE CONNECTOR SHEET APPLICATOR
Filippo Giatti, Bologna, Italy, assignor to AMF Incorporated
Filed Mar. 26, 1970, Ser. No. 22,913
Claims priority, application Italy, Apr. 29, 1969, 6986 A/69
Int. Cl. A24c *05/343, 05/52*
U.S. Cl. 131—21 R **1 Claim**

In this invention, connector sheets are applied to pairs of axially aligned cigarettes and an interposed double length filter plug by means of a rotating drum having on its periphery two corresponding groups of longitudinal fins or projections laterally positioned from each other to define an intermediate region on the drum periphery. The width of the intermediate region is slightly greater than the length of the filter plug while the spacing between the projections is substantially equal to that of the circumference of a cigarette. The drum is operatively associated with a mechanism which cuts connector sheets from a continuous tape, the sheets being coated with adhesive on its upper surface relative to the drum in the area corresponding to the intermediate region between two successive fins, the drum also being associated with a transfer means which transfers to the drum,



for each connector sheet, a pair of cigarettes with the interposed filter plug, selectively actuated pneumatic cigarette and connector sheet retaining means being provided to cooperate with the drum. The cigarettes and the filter plug are rolled on their own axis on the periphery of the drum to wrap around itself the adhesive connector sheet.

3,665,931
CIGARETTE RIPPING DEVICE
Carlo Mizzau, Bologna, Italy, assignor to AMF Incorporated
Filed June 22, 1970, Ser. No. 48,161
Claims priority, application Italy, July 18, 1969, 7183-A/69
Int. Cl. A24c *05/36;* **G05d** *07/06*
U.S. Cl. 131—21 R **10 Claims**



In this invention, cigarettes are processed to separate the tobacco from the other parts of the cigarette. The cigarettes are stored in a random manner in a bin. An endless belt having paddle-like projections scoops cigarettes from the bin and deposits them onto a feed track having a plurality of channels. The cigarettes travel along each of the channels in end-to-end relationship. As the cigarettes travel along the channels, the cigarette paper is wet along a line that is parallel to

the axis of the cigarette, the paper is opened along the wet line, the cigarette is further opened and filter plugs, if present, are broken away, and the tobacco is then separated from the other parts of the cigarette.

3,665,932

APPARATUS FOR FEEDING AND CLASSIFYING CUT TOBACCO

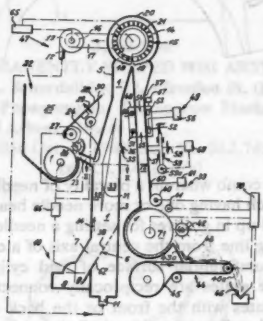
Manfred Goldbach, Hamburg-Bergedorf, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg-Bergedorf, Germany

Continuation of application Ser. No. 688,576, Dec. 6, 1967, now abandoned. This application June 5, 1970, Ser. No. 41,782

Claims priority, application Germany, Dec. 9, 1966, H 61235

Int. Cl. A24b *07/14*

U.S. Cl. 131—21 R 11 Claims



Apparatus for feeding and classifying tobacco wherein a distributor feeds a mixture of lighter and heavier tobacco particles into an intermediate portion of a vertical duct wherein an ascending current of air entrains lighter particles but permits heavier particles to drop by gravity. The upper portion of the duct is closed by the rotor of a suction drum which accumulates lighter particles and transfers them into the upper end of a vertical chute wherein the lighter particles form a column. The material of the column is evacuated at the lower end of the chute and is converted first into a carpet of uniform height and width and thereupon into a narrow tobacco rope or stream. The rate at which the distributor delivers tobacco particles into the duct can be regulated as a function of the height of the column in the chute and/or as a function of density of tobacco particles in the lower part of the column. Furthermore, the height of the column can be regulated as a function of density of tobacco particles in the lower end of the chute and/or the density of tobacco particles in the chute can regulated as a function of the results of measurement of density in the lower region of the column.

3,665,933

CONVEYOR SYSTEMS

Desmond Walter Molins, and Alan Keith McCombie, both of London, England, assignors to Molins Machine Company Limited, London, England

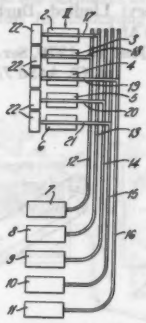
Filed Feb. 10, 1970, Ser. No. 10,214

Claims priority, application Great Britain, Feb. 14, 1969 8,314/69

Int. Cl. A24c *05/35*

U.S. Cl. 131—25 15 Claims

This invention concerns a cigarette making and packing complex comprising a number of cigarette making machines, a number of cigarette packing machines and a conveyor system comprising a number of delivery conveyors each of which is permanently associated at one end with one particular maker or packer and can be selectively connected at its other end to any one of a number of packers or makers as the case may be.



3,665,934

ASH EJECTING AND CLEANING UNIT FOR TOBACCO PIPES

Kenneth R. Townsend, P.O. Box 466, Vanceboro, N.C.

Filed Nov. 30, 1970, Ser. No. 93,532

Int. Cl. A24f *03/02*

U.S. Cl. 131—183 10 Claims

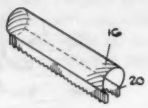
An ash ejecting and cleaning unit for tobacco pipes is described. The unit includes a cylindrical sleeve that reduces to a relatively small opening at the top. A push rod extends from above the opening in the top to approximately the level of the lower end of the sleeve. A disk having a pair of outwardly and downwardly projecting wings is fixedly attached to the upper end of the push rod and a button, which is generally rectangular when viewed from below, is fixedly attached to the lower end of the push rod. A coil spring is located about the push rod between the upper surface of the button and the bottom surface of the reduction region located at the top of the sleeve. The entire unit is mounted in cylindrical aperture formed between the bottom of a conventional pipe bowl and the outer bottom of the pipe. When the push button is rotated, the rod and the attached winged disc also rotate to loosen tobacco residue about the top of the sleeve. Thereafter, when the button is pushed toward the bowl and the bowl is inverted, the loosened tobacco residue is ejected.

3,665,935

METHOD OF STRAIGHTENING KERATINOUS FIBERS

Patricia Alexandra Kingshott, Pinetown, Natal Province, Republic of South Africa, assignor to Kingshott Investments (Proprietary) Limited, Durban, Natal Providence, Republic of South Africa

Filed June 16, 1970, Ser. No. 46,653
Int. Cl. A45d 7/00
U.S. Cl. 132—7 5 Claims



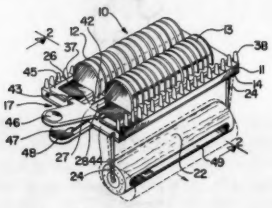
This invention concerns a method of straightening keratinous fibers, especially hair, by applying an oily preparation, subsequently applying a composition containing ammonia and thioglycolic acid as constituents, applying tension to the fibers by gripping them between under tension between a mandrel and a clamp and subsequently releasing the tension when fibers have been straightened. The oily composition may contain cholesterol, sulphonated castor oil, sodium lauryl sulphate and water.

3,665,936

HAIR WAVE AND CURL SETTING DEVICE

Evelyn M. Pugh, 10 St. Nicholas Terrace, New York, N.Y.

Filed Apr. 5, 1971, Ser. No. 130,967
Int. Cl. A45d 1/00
U.S. Cl. 132—9 5 Claims



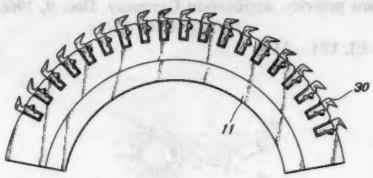
This device comprises a flat base member having slots therein, grooved hair wave guide members adjustable in the slots and a rack and pinion mechanism for adjusting the hair wave guide members to place the wave in the hair held clamped over the members and to comb teeth by a spring finger clamp. This clamp has three fingers extending along the sides of the base member and in between the base member is a finger which has a series of holes for accommodating the combed teeth located a central intermediate portion of the base member lying between the opposite sides of the slots thereof and between the grooved guide members. After the hair strands have been clamped over the hair guide members ends can be rolled up on a curler supported on wire supports to the base and in such a manner that the curler can be pivoted. In this manner the hair strands are provided with a wave intermediate the length of the hair and with curls in the ends of the hair at the same time. The hair after being shampooed and washed and with set lotion applied to the hair, will be provided with the device and after a sufficient drying time a permanent set will have been given to the hair.

3,665,937

CYLINDER COMB

Keijiro Nakagawa; Junichiro Nakagawa, both of 442-3, Oazaoka Ano-mura, and Wasuke Tsuda, 490-6, Oazaoka Ano-mura, all of Age-gun, Mie-ken, Japan

Filed Oct. 28, 1969, Ser. No. 871,840
Claims priority, application Japan, May 19, 1969, 44/38901; June 24, 1969, 44/60239
Int. Cl. A45d 24/00
U.S. Cl. 132—11 8 Claims



A cylinder comb wherein a plurality of needle plates of the same type each having one or more needle heads on the head part are piled up in grooves for setting a needle row provided on a radiating line from the central axis of a cylinder on the exterior circumferential surface of said cylinder, and adjacent needle plates are reciprocally connected by joining belt-typed plates with the front or the back surface of the base part of the above-mentioned piled-up needle plates.

3,665,938

HAIR ROLLER CONTAINING TEMPERATURE INDICATOR

Arne Bybjerg Pedersen, Hovvejen, Kalundborg, Denmark, assignor to Bristol Myers Company, New York, N.Y.

Continuation-in-part of application Ser. No. 612,102, Jan. 27, 1967, now abandoned. This application Jan. 27, 1970, Ser. No. 6,332
Int. Cl. A45d 2/12; C09k 3/04
U.S. Cl. 132—33 R 9 Claims

A temperature indicator which consists of a suspension of a cuprous mercuric iodide complex in a transparent carrier, which is able to protect the complex indicator compound against deterioration from sublimation of the mercuric part of the complex and to protect the same against the detrimental influence from the ambient atmosphere such as oxygen. The indicator may be further protected by a transparent cured cover, and it will change its color at 65°–75° C from red to black, when heated and back again to red when cooled. These temperature indicators are particularly adopted for use on heated hair rollers to identify to the user, when each roller is ready for use.

3,665,939

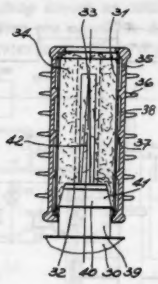
HAIR ROLLER AND AN APPARATUS FOR HEATING HAIR ROLLERS

Ingeborg Laing, 7141 Aldingen near Stuttgart, Hofener Weg 35-37, Stuttgart, Germany

Filed June 4, 1969, Ser. No. 830,322
Claims priority, application Austria, June 6, 1968, A 5389/68
Int. Cl. A45d 2/12
U.S. Cl. 132—33 R 21 Claims

A hair roller having a container enclosing a thermally chargeable storage body of a hydrate which melts at working temperature. Advantageously a heat insulation is provided

between said storage body and a sleeve enclosing said container. An apparatus for heating a plurality of hair rollers



comprises thermally conductive projections supporting the hair rollers.

3,665,940

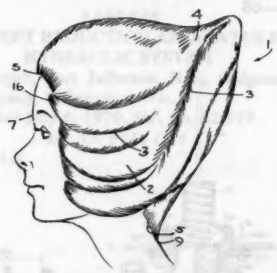
PERMANENTLY SHAPED WIG ARTICLE

Constantios A. Schordalides, 32, Efroniou St. (Pangrati), and Dimitri G. Papageorgiou, 58, Spyrow Merkouri, St. T.T. 516, both of Athens, Greece

Filed Oct. 1, 1969, Ser. No. 862,745

Int. Cl. A41g *3/00*

U.S. Cl. 132—53 **19 Claims**



An improved wig article comprising a substantially rigid backing member shaped to contain predetermined projections and depressions on at least the outer surface of the member, and hair or hair-like material secured to the outer surface of the rigid base member in conformity with the projections and depressions thereby providing a wig article of a coiffure predetermined by the shape of the projections and depressions.

3,665,941

APPARATUS FOR CLEANING TANKS AND ASSOCIATED PIPELINES

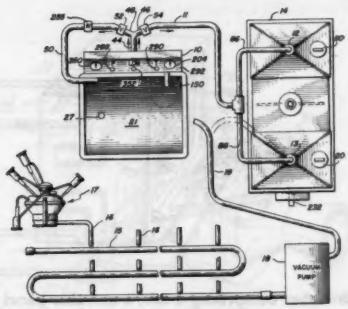
Andrew Geo. Griparis, Joliet, Ill., assignor to The Diversey Corporation, Chicago, Ill.

Continuation of application Ser. No. 763,823, Sept. 30, 1968, now abandoned. This application Sept. 18, 1970, Ser. No. 73,511

Int. Cl. B08b *3/02*, *9/08*

U.S. Cl. 134—58 R **11 Claims**

Apparatus for spray cleaning the soiled interior surfaces of a tank by alternately: (1) applying a burst of cleansing liquid through a sprayer which directs a heavy spray mist to saturate the interior tank surfaces; and (2) enabling the applied cleansing liquid to soak for a timed interval on the tank surfaces. Portions of the apparatus can be used for cleaning pipelines associated with the tank. A tank sprayer which includes an equalization chamber to form a heavy spray mist in cleaning tank interiors. A quick drain valve for rapidly draining large amounts of liquid from a conduit including a solenoid actuated seal for selectively sealing or opening a series of drain openings around the perimeter of the valve. A liquid level indicating apparatus for indicating the drop in level



below a preset level of liquid in any one of a number of closed containers each having a narrow neck for filling the contained, including a detector inserted through each container neck for detecting the level changes, and a single air pressure sensor responsive to the detected changes in any of the containers for indicating a low level condition.

3,665,942

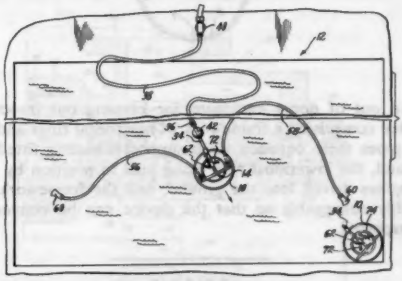
SWIMMING POOL CLEANING DEVICE

Werton D. Moore, Dallas, Tex., assignor to Marty Ross and Danny Henderson, Las Vegas, Nev.

Filed Nov. 17, 1971, Ser. No. 199,644

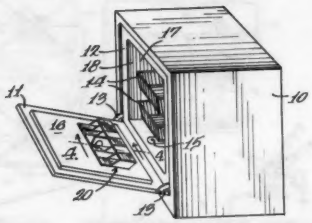
Int. Cl. B08b *3/02*

U.S. Cl. 134—167 R **11 Claims**



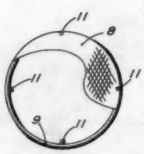
A swimming pool cleaning device having a floating head which is placed upon a pool surface and adapted to be supplied with water from a floating flexible hose, the floating head having cleaner hose attachments and an impeller all receiving a portion of the water supplied to the head, the impeller and a rudder being carried by a hollow swivel through which water is supplied to the impeller and being so constructed and arranged as to propel and guide the head around the pool in a random manner.

3,665,943
DISHWASHER
William T. Lampman, St. Joseph, and Charles H. Wade, Benton Harbor, both of Mich., assignors to Whirlpool Corporation
Filed Mar. 18, 1969, Ser. No. 808,242
Int. Cl. B08b 3/00
U.S. Cl. 134—200 10 Claims



A dishwasher comprising a tub, a movable panel such as a door providing access to the interior of the tub and having a front surface facing the tub interior, a silverware basket having side walls, a water pervious front wall on the side adjacent the tub interior, a water pervious bottom wall and a water pervious back wall, and fasteners for releasably mounting the basket on the front surface so that the loaded basket may be easily attached, and at the conclusion of the dishwashing operation the basket and the silverware contained therein may be removed from the dishwasher.

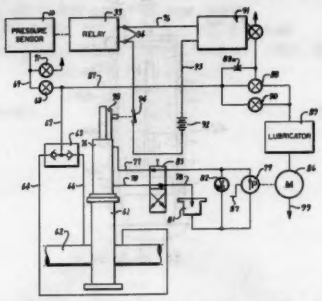
3,665,944
BUG HOUSE
Max C. Knapp, 23529 Lake Manor Dr., Chatsworth, Calif.
Filed Dec. 2, 1970, Ser. No. 94,506
Int. Cl. A45f 1/00
U.S. Cl. 135—1 R 1 Claim



An out of doors enclosure for keeping out insects, the device comprising a framework of horizontal rings and vertical pipes there between so to support a netting fitted there around, the lowermost ring being held in position by means of spikes driven into the ground, and the framework being readily collapsable so that the device can be conveniently transported.

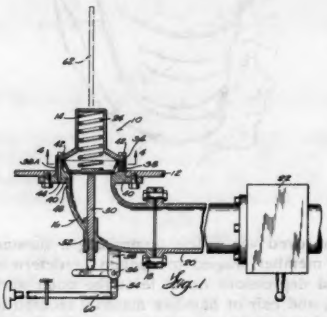
3,665,945
VALVE CONTROL SYSTEM AND METHOD
Sidney Allan Ottenstein, Spring, Tex., assignor to M & J Valve Company, Houston, Tex.
Filed Feb. 2, 1971, Ser. No. 112,343
Int. Cl. F16k 31/00
U.S. Cl. 137—14 23 Claims

An electronic system and method suitable for initiating the functioning of power operators for one or more flow control valves, responsive to controlling input signals. The controlling signals may be derived from or responsive to operating conditions of the system with which the valve is associated, such as a pressure drop in the line with which the valve is associated. The electronic system initiates operation of the valve responsive to such signals and serves to effect operation of the valve in a predetermined manner or accord-



ing to a predetermined program, e.g., to close the valve when a pressure drop occurs at a rate greater than a predetermined value.

3,665,946
TANK TRUCK SAFETY VALVE
Bernie E. Robinson, Oak Creek, Wis., assignor to Milwaukee Valve Company, Inc., Milwaukee, Wis.
Filed Aug. 10, 1970, Ser. No. 62,267
Int. Cl. F16k 27/03
U.S. Cl. 137—68 4 Claims

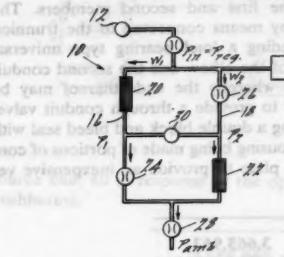


The upper portion of the valve body encloses the spring acting on the diaphragm valve to normally seat the valve. The lower portion of the valve body carries the valve actuator which lifts the valve against the spring load. If the outlet portion is struck hard enough, the groove in the body just below the valve seat will break, which allows the outlet and actuator to fall away whereupon the spring closes the valve. This prevents accidental loss of the contents of the tank truck. The spring chamber is vented. The parts exposed to the contents are readily cleaned in place.

3,665,947
FLUIDIC SENSING CIRCUIT AND PRESSURE REGULATOR
Endre A. Mayer, Birmingham, Mich., assignor to The Bendix Corporation
Filed Jan. 5, 1970, Ser. No. 753
Int. Cl. F15c 1/00
U.S. Cl. 137—81.5 26 Claims

A fluidic pressure regulator for maintaining a system pressure over a range of ambient pressures, which includes a

pressure sensing circuit comprised of a bridge network of orifice and laminar flow restrictors providing an output error signal for all pressures except the unique null pressure at which the pressure drop across an orifice restriction and a laminar flow restriction are equal. A downstream orifice is provided which operates in the sonic regime to eliminate the



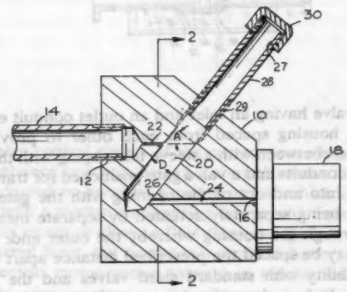
effects of ambient pressure shifts on the null point, while the error signal is used with a flow controller to maintain the system pressure at this null point. In a second version, the effects of temperature on the null point are eliminated by means of a temperature controlled variation of the area of the downstream orifice.

3,665,948

TRANSIENT REDUCTION APPARATUS FOR HYDRAULIC SYSTEM

Clive P. Hohberger, Port Jefferson, N.Y., assignor to Allen-Bradley Company, Wilwaukee, Wis.

Filed July 6, 1970, Ser. No. 52,519
Int. Cl. F15c *1/16*
U.S. Cl. 137—81.5 **5 Claims**



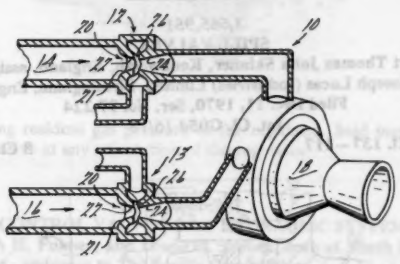
Apparatus for coupling a hydraulic line to a pressure gauge, to reduce the level of high pressure transients that are applied to the guage, comprising a housing with an inlet connected to the hydraulic line, a variable volume chamber coupled to the inlet through a small diameter passageway orifice, and a narrow diameter passageway connecting the chamber to the pressure gauge. The orifice which connects the inlet to the chamber is oriented to direct a jet of oil at an angle, such as 30° to 45° with the chamber walls, to create a vortex in the chamber so that the incoming jet pressure wave is well mixed with the fluid contained in the chamber volume, thereby reducing localized pressure pulses or shock waves that could pass through the chamber to the gauge.

3,665,949

GASEOUS CONTROLLED FLUIDIC THROTTLING VALVE

Jerome G. Rivard, Birmingham, Mich., assignor to The Bendix Corporation

Filed June 27, 1969, Ser. No. 837,217
Int. Cl. F15c *1/00*
U.S. Cl. 137—81.5 **11 Claims**



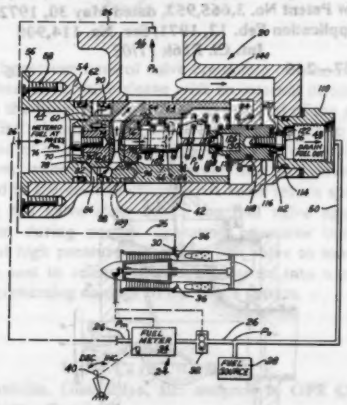
A fluidic throttling valve for controlling flow in a pipe or conduit of a high density fluid, such as a liquid, by injecting a lower density fluid, such as an inert gas, into the pipe. In the preferred embodiment shown herein, this control gas is injected into a pipeline leading to a combustion engine to control the quantity of liquid flowing through that pipeline. The control gas is injected through a slot extending completely around the circumference of the pipe. The gas is injected at the throat section of a venturi constructed in the pipe to define a point of minimal cross-sectional area.

3,665,950

VARIABLE BACK PRESSURE CHECK VALVE AND DRAIN VALVE

Thomas A. Nelson, South Bend, Ind., assignor to The Bendix Corporation

Filed July 13, 1970, Ser. No. 54,416
Int. Cl. F16k *11/22*; F02h *55/00*
U.S. Cl. 137—107 **9 Claims**



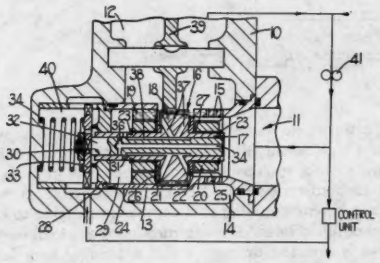
A fluid receiver is connected via a supply orifice to a pressurized fluid supply source and via a fluid drain orifice to a relatively low pressure fluid drain source. A fluid pressure responsive spring-loaded check valve connected to the supply orifice and a drain valve connected to the drain orifice are provided with a one way collapsible link including a

compression spring connecting the same causing the drain valve to open when the check valve is fully closed and close in response to compression of the spring when the check valve moves a predetermined distance in an opening direction. The check valve is provided with a contoured end portion and parallel flow passages in series flow therewith. One of the parallel flow passages includes a venturi for generating a fluid pressure which varies as a function of the flow therethrough and which is imposed on the check valve to assist the spring force acting thereagainst.

3,665,951
SPILL VALVES

Robert Thomas John Skinner, Kenilworth, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 11, 1970, Ser. No. 97,224
Int. Cl. G05d *16/18*
U.S. Cl. 137—117 **8 Claims**

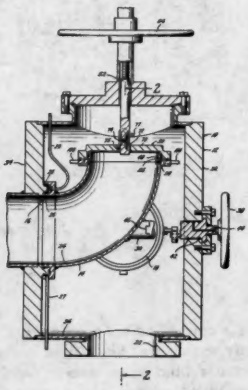


A spill valve for a fuel control system has a pilot valve responsive to the pressure difference across a fuel control unit and a follow-up servo valve assembly controlled by the pilot valve to spill fuel from the upstream side of the control unit. There is relative rotation between the pilot valve and the servo valve assemble to reduce the effects of static friction.

3,665,952
ELBOW VALVE

Clyde H. Chronister, Houston, Tex., assignor to Chronister Valve Company, Inc., Houston, Tex.

Continuation-in-part of application Ser. No. 839,280, July 7, 1969, now Patent No. 3,665,952, dated May 30, 1972. This application Feb. 12, 1971, Ser. No. 114,905
Int. Cl. F16k *11/02*
U.S. Cl. 137—246 **16 Claims**

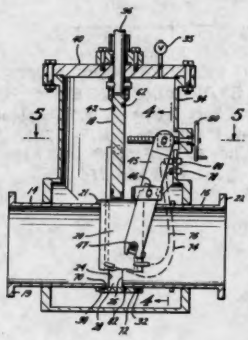


A pipe elbow in a valve housing having first and second conduits extending therein with the elbow pivotally sealable to the first conduit and to a trunnion axially aligned with the first conduit whereby the elbow may be rotated to bring the second end into and out of alignment with the second conduit. Sealing means for closing off the second end of the elbow for equalizing pressure before opening the valve having a first member sealing against the elbow and having an opening therethrough with a second member positioned to extend into the opening and seal therein with a loss motion connection between the first and second members. The elbow being actuated by means connected to the trunnion and the trunnion including a load bearing type universal joint. The second end of the elbow and the second conduit having coacting bevels whereby the ends thereof may be closely spaced together to provide a through conduit valve. The seal means including a double block and bleed seal with a testing conduit. The housing being made of portions of conventional pipe and flat plate to provide an inexpensive yet sturdy valve.

3,665,953
GATE VALVE

Clyde H. Chronister, Houston, Tex., assignor to Chronister Valve Company, Inc., Houston, Tex.

Continuation-in-part of application Ser. No. 823,103, May 8, 1969, now Patent No. 3,557,822. This application Jan. 22, 1971, Ser. No. 108,703
Int. Cl. F16k *43/00*
U.S. Cl. 137—246.22 **10 Claims**



A gate valve having an inlet and an outlet conduit extending into a housing spaced from each other to provide an opening therebetween with a sleeve telescoping with the inlet and outlet conduits and a valve gate positioned for transverse movement into and out of the opening with the gate valve and sleeve being separately actuated by separate means extending through the housing whereby the outer ends of the conduits may be spaced the prescribed distance apart for interchangeability with standard sized valves and the sleeve may be firmly moved against the gate valve to seal the gate valve against the inlet conduit. Lubricant sealing grooves on the inside of said sleeve adjacent each end of the sleeve for lubricating and sealing the sleeve relative to the inlet and outlet conduits.

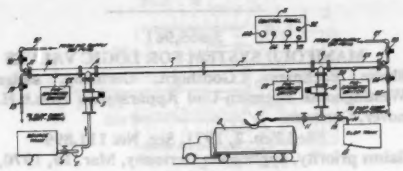
3,665,954
PIG SYSTEM

Donald A. McNeal, Brookhaven, Pa., and Paul A. Dearry, Wilmington, Del., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Feb. 17, 1971, Ser. No. 116,079
Int. Cl. F17d *3/00*
U.S. Cl. 137—268 **12 Claims**

In a system for loading a liquid into a tank truck by means of a pipeline, a pig is used for pushing product through the line toward the truck. This pig is stored at the source end of

the line and is caused to move through the line first toward the truck end, and then back to its storage location at the source end, all in response to the operation of a "pig start" pushbutton.

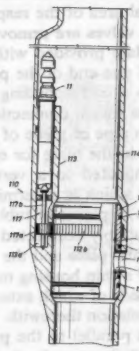


3,665,955

SELF-CONTAINED VALVE CONTROL SYSTEM

George Eugene Conner, Sr., 5559 Hollysprings, Houston, Tex.

Filed July 20, 1970, Ser. No. 56,262
Int. Cl. H04b *13/00, 1/20, 1/02*
U.S. Cl. 137—495 28 Claims



The valve control system of the present invention includes a self-contained operator having a control means and power source adapted to energize a prime mover which in turn is coupled with a motion transmitting means which partially or completely opens or closes a fluid flow passage in a valve. In the preferred form, the operator includes a battery coupled to an electric motor acting through a mechanical driving linkage to open or close a valve. Operation of the motor is governed by the control means which may include pressure or flow responsive means and/or receiving means responsive to sonic or electrical signals transmitted from a remote location. When adapted for use in well valving, the operator is removably received within the inside pocket of a mandrel which houses a valve closure member.

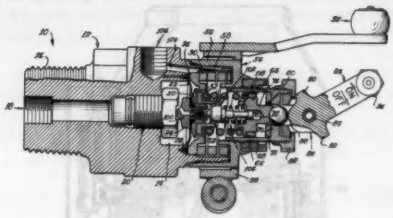
3,665,956

GAS PRESSURE REGULATOR

George L. Hammon, Oakland, Calif., assignor to Chemetron Corporation, Chicago, Ill.

Filed Jan. 29, 1970, Ser. No. 6,786
Int. Cl. F16k *31/365*
U.S. Cl. 137—505.11 4 Claims

In a gas pressure regulator of the type having a normally closed diaphragm-actuated valve, means are provided for relieving residual gas pressure in the regulator. Said means is operative at any orientation of the regulator.

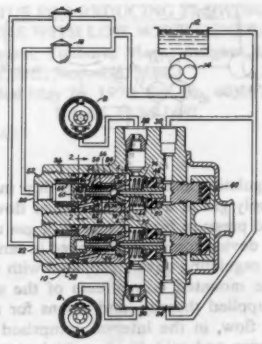


3,665,957

CONTROL VALVE FOR A HYDRAULIC SYSTEM

Keith H. Fulmer, and Deane K. Jenney, both of South Bend, Ind., assignors to The Bendix Corporation

Filed Apr. 13, 1970, Ser. No. 27,552
Int. Cl. B60t *13/14*
U.S. Cl. 137—509 3 Claims



A fluid pressure control valve consisting of a housing with a bore therein. A valve sleeve with an internal division is inserted in the bore. A plug is fixed to one end of the sleeve to form a first chamber and a valve seat attached to the opposite end of a control chamber. A ball valve carried on a valve stem, whose diameter is larger than the valve seat, is contained in the control chamber. A valve return spring surrounding the valve stem biases the ball valve against the valve seat during normal operating pressures but during periods of high pressure allows the ball valve to move away from the seat to release this high pressure into a reservoir thereby preventing damage to the brake system.

3,665,958

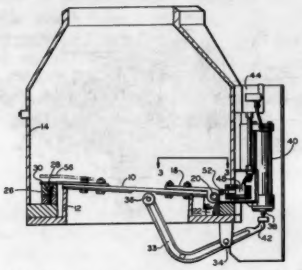
VENT CLOSURE DEVICE

Evald Dunkells, Glen Ellyn, Ill., assignor to GPE Controls, Inc., Morton Grove, Ill.

Filed Sept. 16, 1968, Ser. No. 762,252
Int. Cl. F16k *17/04*
U.S. Cl. 137—522 10 Claims

A hinged cover for a vent opening with safety features to insure reliability of operation in remote and critical applications, such as nuclear reactors. Means are provided for opening the cover from a remote location to insure its freedom of

movement, and to then move it back to the closed position. The latter means comprises a return spring, and a standby



spring is provided to become operative only in the event of breakage or other malfunction of the first spring.

3,665,959

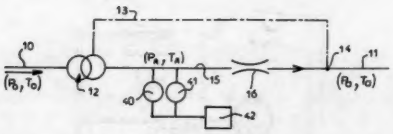
PRESSURE REGULATING AND REDUCING GAS-FLOW METER FOR INDUSTRIAL INSTALLATIONS

Philippe Charles Albert Castillon, Paris, France, assignor to Gaz De France, Paris, France

Filed Mar. 12, 1971, Ser. No. 123,588

Int. Cl. F16k *37/00*

U.S. Cl. 137—551 **6 Claims**



Pressure regulating and reducing gas-flow meter device allowing to supply gas at a variable rate of flow and under a predetermined pressure from a source of gas under a higher pressure. The device comprises arranged in series : a pressure reducing and regulating device provided with a pilot circuit, a sonic nozzle mounted downstream of the said regulating device and supplied thereby, and means for measuring the conditions of flow, in the interval comprised between said regulating device and said nozzle, which conditions enable the rate of flow through the apparatus to be measured.

3,665,960

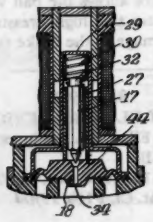
AUDIBLE INDICATOR FOR SOLENOID VALVE

Frank R. Skinner, II, and Robert T. Wigfall, both of St. Joseph, Mich., assignors to Whirlpool Corporation

Filed Sept. 11, 1970, Ser. No. 71,541

Int. Cl. F16k *37/00*

U.S. Cl. 137—551 **15 Claims**



A solenoid valve device having means for providing a signal when the solenoid is energized in the absence of fluid pressure at the inlet of the valve. The signal may comprise an audible sound and more specifically may comprise a tone having a frequency controlled by the frequency of the alternating current applied to the solenoid coil.

3,665,961

MANIFOLD SYSTEM FOR LOGIC VALVES

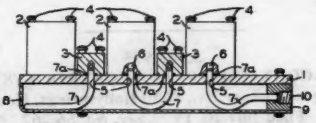
Wilhelm Bachmann, Godshorn, Germany, assignor to Westinghouse Bremsen-Und Apparatebau G.m.b.H., Hannover, Germany

Filed Feb. 2, 1971, Ser. No. 111,899

Claims priority, application Germany, Mar. 19, 1970, G 70 10 075.3

Int. Cl. F17d *1/00*

U.S. Cl. 137—608 **11 Claims**



This invention relates to a manifold through which a source of fluid under pressure is connected to a plurality of logic valves by means of pipes or pieces of tubing each having a bend therein of either 90° or 180° the radius of these bends being that minimum without which a reduction of the internal cross-sectional area of the respective pipe or tubing is effected. The logic valves are removably mounted on top of a flat horizontal plate provided with a plurality of bores through which extend one end of the pipes or pieces of tubing for connection to a corresponding logic valve by some suitable means such as socket connections and sealing rings. The other end of each pipe or piece of tubing extends either through another bore in the plate for connection to another logic valve or is connected to a vertically arranged pipe bracket the height of which is determined by the radius of the bends in the pipes or pieces of tubing. The upper end of the pipe bracket is suitably connected as by screws to one end of the flat horizontal plate and the lower end is likewise secured to one end of a thin housing member in the form of an angle bracket one side of which extends beneath the pipes or tubing in abutting relation therewith. The other side of this angle bracket extends parallel to the pipe bracket and is so disposed as to support thereon the lower side of the other end of the flat horizontal plate on the upper side of which is mounted the logic valves. Thus the pipes or pieces of tubing are enclosed in a hollow box or housing which may be filled with a rigid-type foam material formed in place by using a rigid-type foam such as polyurethane to form a resilient packing around the plurality of pipes or tubes to isolate each from the other and prevent movement thereof relative to the logic valves which movement could cause rupture of the connection therewith.

3,665,962

ELECTRICALLY ACTUATED VALVE

Josephus D. Dornseiffen, Zevenaar, Netherlands, assignor to Turmac Tobacco Company N.V., Zevenaar, Netherlands

Filed Feb. 16, 1970, Ser. No. 12,418

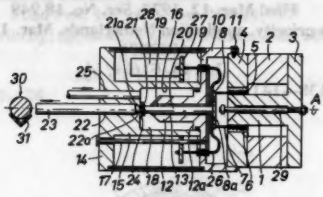
Claims priority, application Netherlands, Feb. 20, 1969, 6902697

Int. Cl. F16k *31/08*

U.S. Cl. 137—624.13 **2 Claims**

Device, comprising a permanent magnetic circuit, a coil suspended for reciprocatal movement within the air gap of said circuit, an enclosed space in front of said air gap, a supply duct connecting said space with a source of constant air pressure, a delivery duct connecting said space with the open air, a valve arranged for opening to a limited extent, determined by an adjustable stop member and for closing

said space from the inside and located at the end of said delivery duct opening into said space, the said coil being fixedly connected to said valve for movement in unison



therewith, said device, on connecting the coil with a source of electric current impulses having a rapid succession being adapted to provide air puffs leaving said delivery duct in accordance with said impulses.

3,665,963

MAGNETIC VALVE

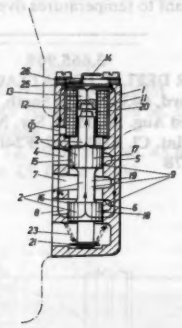
Heinrich Dick, Heidenheim, Germany, assignor to Voith Getriebe KG, Heidenheim (Brenz), Germany

Filed Feb. 12, 1970, Ser. No. 10,761

Claims priority, application Germany, Feb. 21, 1969, P 19 08 659.0

Int. Cl. F16k *31/06*

U.S. Cl. 137—625.48 **5 Claims**



A magnetic valve in which the valve housing with the casing for the valve spool is made of a magnetically uniform piece while the armature of the magnet and the valve spool are likewise made of a magnetically uniform piece, the magnetic flux being passed from the iron casing into the armature of the magnet through the guiding surfaces between the valve housing and the valve spool. By sufficiently dimensioning the diameter of the valve spool and by sufficiently dimensioning the length of the valve spool and thereby the contacting surface thereof, it is possible to maintain the magnetic flux small so that a magnetic jamming of the valve spool with the harmful consequences thereof cannot occur.

3,665,964

STEAM TURBINE CONTROL VALVE STRUCTURE

Robert O. Brown, Media; Edwin G. Noyes, Jr., Newtown Square, and Joseph D. Conrad, Jr., Glen Mills, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

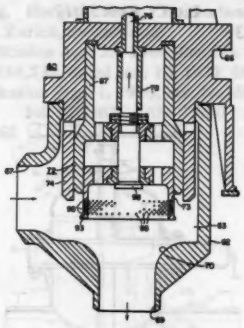
Original application Mar. 27, 1969, Ser. No. 811,007.

Divided and this application Jan. 27, 1971, Ser. No. 110,187

Int. Cl. F16k *11/14*

U.S. Cl. 137—630.13 **5 Claims**

The invention provides novel valve structure for controlling the supply of hot pressurized steam to a steam turbine with a minimum of noise and vibration, especially in the partially open position where a large degree of throttling is attained. Tubular structure having a large number of perforations that are progressively uncovered as the valve plug is moved in opening direction is provided, thereby imposing a



large number of small throttlings in the steam flow (instead of the usual single large throttling) with attendant reduction in noise and vibration level over the entire operating range of the valve.

3,665,965

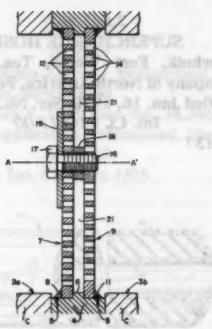
APPARATUS FOR REDUCING FLOWING FLUID PRESSURE WITH LOW NOISE GENERATION

Hans D. Baumann, Foxboro, Mass., assignor to Masonellan International, Inc., Norwood, Mass.

Filed May 26, 1970, Ser. No. 40,607

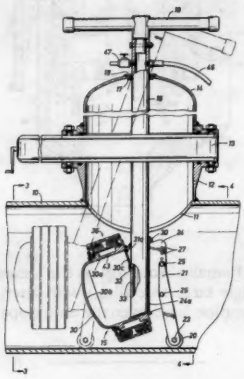
Int. Cl. F15d *1/00*

U.S. Cl. 138—42 **12 Claims**



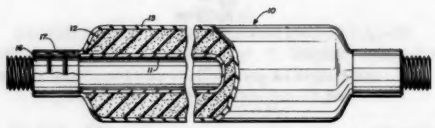
Fluid pressure reducing apparatus presenting low noise throttling plates. The low noise fluid pressure throttling apparatus provides an assembly of a plurality of such plates, and which may comprise a segment of or be interposed in a fluid flow containing conduit. The low noise throttling plates are passaged by multiple small section orifices producing a high frequency pressure wave whose noise is more readily attenuated by the conduit. The spacing of the plates in the pressure reducing assembly defines with the intervening flow containing means a volume which is dimensioned to produce resonant damping of the noise pressure wave generated in the primary orifices. The pressure drop through the reducing apparatus is divided into nearly equal ratio drops across each plate, further minimizing noise generation.

3,665,966
PIPE PLUGGER
Burton Ver Nooy, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.
Continuation of application Ser. No. 808,078, Mar. 18, 1969, now abandoned. This application Dec. 14, 1970, Ser. No. 98,149
Int. Cl. F16l 55/12
U.S. Cl. 138—93 11 Claims



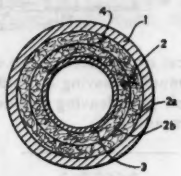
A pipe plugger disclosed includes a sealing element that can be expanded inside the pipe to plug off a range of pipe diameters. The element is inserted into a pipe, relaxed and unexpanded, through an opening of uniform diameter. This allows pipe tapping equipment for cutting a side opening of one diameter to be used with a range of pipe sizes, which results in a considerable reduction in the equipment required to handle plugging operations in a variety of pipe diameters.

3,665,967
SUPERCHARGE HOSE
Joseph E. Kachnik, Fort Worth, Tex., assignor to The Western Company of North America, Fort Worth, Tex.
Filed Jan. 16, 1970, Ser. No. 3,352
Int. Cl. F16l 11.00
U.S. Cl. 138—137 4 Claims



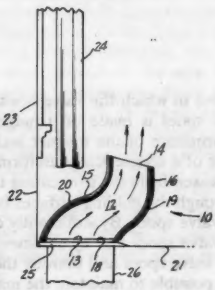
A conduit is provided for use in fluid-conducting systems which are subjected to pressure surges and includes an inner conduit for carrying fluid which is surrounded by a body of resilient material adapted to absorb undulations of the inner conduit in response to pressure surges of the fluid. In one embodiment the inner conduit is an expandable conduit and the resilient body is contained within a reinforcing member. In this embodiment, the inner conduit expands in response to pressure surges and thereby functions as an accumulator, so as to prevent damage to equipment in the system, such as pressure gauges, piping, and conduits, or for example, to even out the flow discharge from a positive displacement pump for the fluid.

3,665,968
INSULATED TUBE
Warner Jan De Putter, Zwolle, Netherlands, assignor to Industriele Onderneming Wavin N.V., Zwolle, Netherlands
Filed Mar. 12, 1970, Ser. No. 18,949
Claims priority, application Netherlands, Mar. 13, 1969, 6903871
Int. Cl. F16l 9/14
U.S. Cl. 138—141 2 Claims



An insulated tube comprising an inner protective layer of polyurethane or hard polyurethane foam plastic, an intermediate layer of polyurethane foam plastic insulation and an outer layer of glass fiber reinforced polyester resin. Reinforcing glass tissue layers might be present in the space between the inner and outer layers. The polyurethane foam plastic insulation is resistant to temperatures over 120° C.

3,665,969
AIR DEFLECTOR ATTACHMENT
Joseph M. Clifford, 643 E. 4350 South, Salt Lake City, Utah
Filed Aug. 28, 1970, Ser. No. 67,863
Int. Cl. F16l 9/00; F24f 13/06
U.S. Cl. 138—178 4 Claims



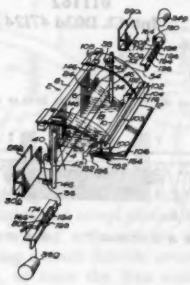
An air deflector attachment for heating and/or cooling ducts opening through the floor wall or ceiling to move the column of air outwardly from an adjacent wall or ceiling permitting the curtains, furniture, persons and objects to be in the room without being directly contacted by the column of air. The deflector includes serpentine inner and outer walls mounted in serpentine tracks formed in spaced parallel end walls. The end walls are provided with serpentine tracks on each side face thereof to permit the joining together of a plurality of side walls when an especially long deflector is required. The deflector offsets the path of the column of air but retains its direction characteristic for efficiency in hot and cold air distribution.

3,665,970

PICKING MECHANISM FOR LOOMS FOR WEAVING

Ian S. Porter, Barnsley, England, assignor to Wilson & Longbottom Limited, Barnsley, England

Filed Feb. 16, 1970, Ser. No. 11,797
Claims priority, application Great Britain, Feb. 18, 1969, 8,679/69
Int. Cl. D03d *17/24*
U.S. Cl. 139—20 12 Claims



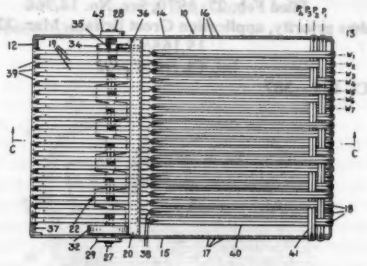
A weaving loom in which warp yarns are divided into an upper and a lower shed through which an upper and a lower gripper shuttle are respectively picked simultaneously, each from an opposite side of the loom; and a weft yarn presenter at each side is moved up and down to supply either shuttle with weft alternately.

3,665,971

HAND WEAVING LOOM

Eugene Ileks, Providence Hospital, 3276 St. Clair Ave. East, Toronto, Ontario, Canada

Filed June 12, 1970, Ser. No. 45,805
Int. Cl. D03d *29/00*
U.S. Cl. 139—33 1 Claim



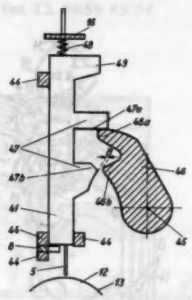
A hand operated weaving loom comprising, a rectangular frame having a pair of side walls and a pair of end walls, a series of lifters pivotally mounted on a first end wall for retaining the warp threads and a detachable rotatable cam mechanism positioned below the lifters and supported by the side walls whereby on rotation of the cam mechanism the lifters are oscillated upwards and downwards relative to the longitudinal axis of the frame to effect shedding of the warp threads and to produce the desired weaving pattern. One end of the warp thread is attached to a hook provided on the end of the lifter and the other end of the warp thread is attached to a series of fingers mounted on the second end wall. At predetermined positions of the cam assembly the weft threads are inserted manually between the warp threads and the ends of the weft threads are attached to a series of fingers mounted on each of the side walls. In one embodiment each of the warp and weft threads is in the form of an elongated elastic loop. The weaving pattern may be varied by interchanging the cam mechanism and utilizing a different set of cams.

3,665,972

DOBBIES

Ernest Hoenig, Horgen-Zurich, Switzerland, assignor to Staubli Ltd., Zurich, Switzerland

Original application Apr. 23, 1968, Ser. No. 723,527, now Patent No. 3,554,238, dated Jan. 12, 1971. Divided and this application Sept. 1, 1970, Ser. No. 68,736
Int. Cl. D03C *1/00, 15/00*
U.S. Cl. 139—68 5 Claims



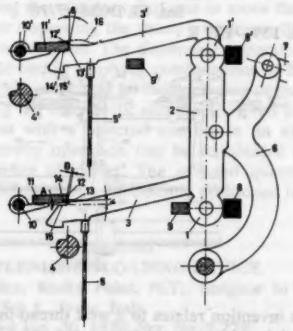
A dobby in which the reading needles are actuated into reading position of a perforated pattern card by a first system that applies a low value driving force to the needles so that the pattern card is not damaged if a perforation is not sensed by the needles as would be the case if too strong a force were applied to the reading needle. A second driving system operative in a series mode with the first system applies a stronger driving force to the needles in those instances where a perforation in the pattern card is read by the needles.

3,665,973

DOBBY

Adolf Reisdorf, Horgen-Zurich, Switzerland, assignor to Staubli Ltd., Zurich, Switzerland

Filed May 4, 1970, Ser. No. 34,399
Claims priority, application Switzerland, May 5, 1969, 6845/69
Int. Cl. D03c *1/06*
U.S. Cl. 139—71 3 Claims



A dobby of the Hattersley type comprising a hook hinged to a baulk, the hook being adapted to engage with and

withdrawn from a draw-blade, and a rotationally mounted support blade having a contact surface adapted to engage the hook when the hook is raised.

3,665,974

DEVICE FOR PREPARING A WEFT

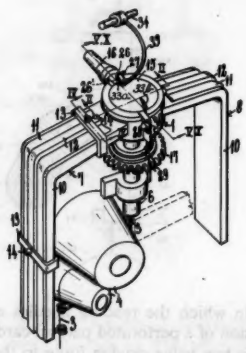
Antonius Martinus Barten, Deurne, Netherlands, assignor to N. V. Machinefabriek L. Te Strake, Deurne, Netherlands

Continuation-in-part of application Ser. No. 828,291, May 27, 1969. This application Aug. 2, 1971, Ser. No. 168,182

Claims priority, application Netherlands, May 29, 1968, 6807613

Int. Cl. D03d 47/28, 47/34

U.S. Cl. 139—127 P **11 Claims**



A presenting device for conducting a weft thread is rotatable on an axis and has an axial thread inlet and a thread outlet at a point spaced from the axis. A member for temporarily storing a loop in the thread has an entrance arranged adjacent to the path of rotation of the thread outlet of the presenting device, to receive a loop of thread from such outlet. A thread clamp is arranged adjacent to the entrance of the storing member for clamping one end of such loop of thread, and a weft inserting device is arranged adjacent to the path of rotation of the thread outlet of the presenting device, to receive the other end of the loop of thread from such outlet.

3,665,975

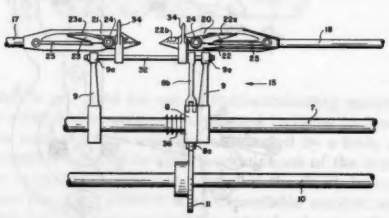
WEFT THREAD INSERTING MECHANISM FOR LOOMS

Nikolaus Kokkinis, Eriskirch, Germany, assignor to Lindauer Dornier Gesellschaft m.b.H., Lindau/Bodensee, Germany

Filed Jan. 19, 1970, Ser. No. 3,902

Int. Cl. D03d 47/18

U.S. Cl. 139—127 R **10 Claims**



This invention relates to a weft thread inserting device for a shuttleless loom comprising a pair of gripper rods having gripper heads mounted on the ends thereof, the gripper rods being mounted for reciprocating movement and being adapted to extend into the shed whereby a weft thread is transferred from one gripper head to the other, and clamping means on the gripper heads for the weft thread adapted to be positively actuated from the exterior of the shed.

3,665,976

SUCTION APPARATUS ON A TEXTILE MACHINE

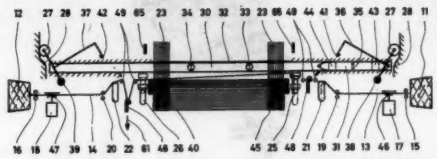
Alexis Freihofer, Ruti/ZH, Switzerland, assignor to Ruti Machinery Works, Ltd., Ruti/ZH, Switzerland

Filed June 29, 1970, Ser. No. 50,722

Claims priority, application Switzerland, July 22, 1969, 011162

Int. Cl. D03d 47/24

U.S. Cl. 139—126 **17 Claims**



A suction apparatus for picking up the free end-portion of a thread on a textile machine wherein the thread is brought into a freely stretched condition over a suction means and is drawn into this means by a suction action, said apparatus comprising a thread-holder located on the suction means, said holder comprising clamping zones that are biassed towards each other for clamping a thread therebetween and guide means for guiding the end-portion of the thread towards the clamping zones; and means for pulling the end-portion of the thread, drawn into the suction means, in between the clamping zones.

3,665,977

CURTAIN HEADING TAPE

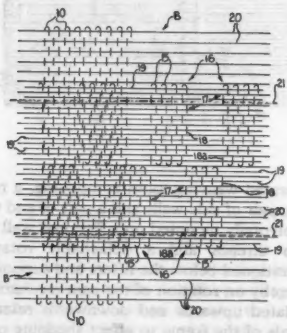
Roger Heldt, Paris, France, assignor to Thomas French & Sons Limited

Filed Feb. 27, 1970, Ser. No. 14,966

Claims priority, application Great Britain, Mar. 22, 1969, 15,165/69

Int. Cl. D03d 3/02

U.S. Cl. 139—387 **9 Claims**



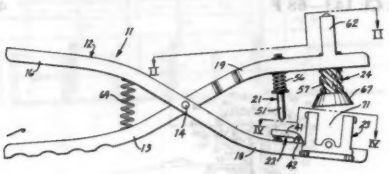
A curtain heading tape in which lateral stiffness is provided by using, as a weft in the body of the fabric, a composite yarn consisting of a core of relatively stiff synthetic yarn around which is wrapped at least one other yarn, whereby the composite yarn so formed has a surface characteristic such that any tendency of warp yarns to slip relative to the weft yarns when the fabric is woven is prevented or substantially reduced due to the uneven surface of the composite yarn.

3,665,978

TIEING TOOL

Marlow H. Pardike, 209 Pine St., Paw Paw, Mich.

Filed Nov. 12, 1970, Ser. No. 88,814
Int. Cl. B21f 15/04
U.S. Cl. 140—93 A 10 Claims



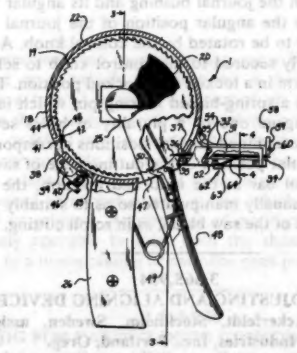
A hand tool for tieing objects, such as grape vines, having a pair of pivotally connected levers manually movable toward one another and provided with suitable coacting structure thereon for permitting a small flexible member, such as a U-shaped wire staple, to have the free ends thereof twisted together for bundling the objects together. A staple-holding cartridge is mounted on one lever and disposed opposite a rotatable twisting member mounted on the other lever, which twisting member is disposed for engaging the free ends of an ejected staple for twisting the free ends together. An ejecting mechanism is disposed adjacent the cartridge for ejecting a selected staple, and an actuating mechanism coacts with the ejecting mechanism in response to relative pivotal movement of the levers toward one another whereby the selected staple is automatically ejected and the free ends thereof twisted together.

3,665,979

BANDING APPARATUS

Dory J. Neale, Sr., 3710 Shore Acres Blvd., St. Petersburg, Fla.

Filed June 25, 1970, Ser. No. 49,594
Int. Cl. B21f 9/02
U.S. Cl. 140—93.4 9 Claims



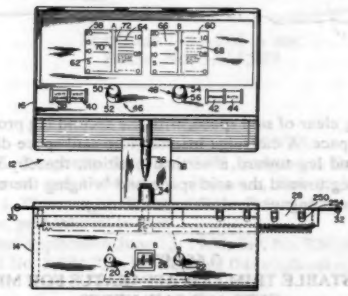
A banding apparatus for flexible bands or tape and comprising a clip having a passage therethrough to receive portions of lashing tape extending around an article to be lashed or banded and a tape dispensing and tightening device operative to effect movement of clip portions to engate a plurality of teeth on the clip into engagement with the tape portions to hold said tape or band portions against movement. The tape dispensing device has a tape compartment and means for mounting a roll of flexible lashing tape therein and a passage extending through the tape compartment and ratchet means mounted on the tape compartment for effecting retractive movement of a portion of the tape through the passage and into the tape compartment thereby moving the clip into engagement with the article to be lashed and setting the teeth in the tape portions.

3,665,980

DISPENSING APPARATUS AND ASSOCIATED ELECTRONIC CONTROL FOR SELECTING DIFFERENT MODES OF OPERATION

Michael E. Croslin, Forest Hills, and Carl R. Blackman, Westbury, both of N.Y., assignors to Grumman Data Systems Corporation

Filed Dec. 9, 1969, Ser. No. 883,573
Int. Cl. B65b 43/54
U.S. Cl. 141—183 9 Claims



A dispensing apparatus is provided which has various modes of operation including automatic, manual and prime modes. The dispensing apparatus includes coarse and fine metering devices consisting of cylinders with pistons displaceable therein, the displacement of the pistons being controlled by adjustable switches in turn controlling electronic circuits which reverse the direction of movement of the pistons. The metering devices are associated with dispensing nozzles beneath which can be stepped a tray in which are positions for vials or other such receptacles. A sensing switch is provided to detect the presence or absence of receptacles in the aforesaid positions to prevent attempts to dispense fluids into positions in which there are no receptacles. The tray is electronically controlled for automatic or manual modes of operation and a cam control switch is provided which determines whether the tray has been stepped to discrete positions for which dispensing operations might be effected. The apparatus employs a bi-directional, three port valve for enabling the withdrawal of one or more fluids from a source and for dispensing the thusly withdrawn fluids into the aforenoted receptacles. The dispensing apparatus is controlled by a logic circuit involving combinations of flip flops, OR gates and AND gates, and further including decade counters for counting the number of receptacles filled and comparing the count with a selected number in an electronic comparator whereby operation can be terminated after an appropriate number of cycles. The selected quantities for dispensing are indicated on conveniently positioned indexes.

3,665,981

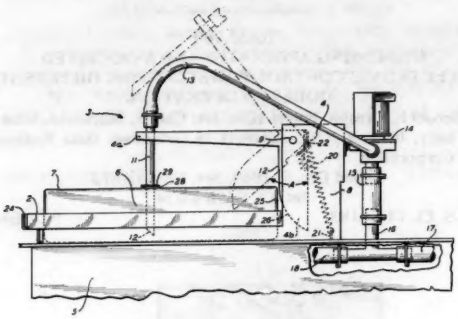
REPLENISHER LOADING DEVICE

Allen R. Trebbien, Rocky Point, N.Y., assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 30, 1970, Ser. No. 7,278
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—329 5 Claims

A loading device for receiving, engaging and holding a cartridge container of liquid replenisher or the like. An L-shaped tilt member is pivotably mounted above a space at a

receiving cradle adapted for receipt of said cartridge. One leg of said member carries transverse thereto a tubular coupling means for engaging said cartridge and its liquid contents. The said member is spring-biased about its pivot so that in the absence of a cartridge said one leg and the coupling means



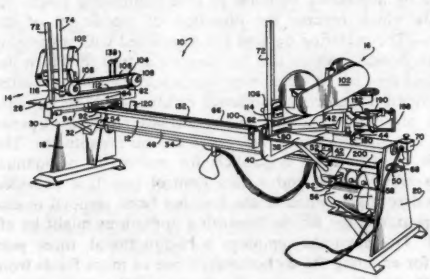
are swung clear of said space, with the second leg protruding into the space. A cartridge inserted into said space displaces said second leg toward a vertical position, thereby rotating the first leg toward the said space and bringing the coupling member into engagement with the cartridge.

3,665,982

ADJUSTABLE TRIM SAW APPARATUS FOR MITER CUTS AND SAW KERFS

Andrew M. Kvalheim, Petaluma, Calif., assignor to Kvalheim Machinery Co., Petaluma, Calif.

Filed Feb. 13, 1970, Ser. No. 11,191
Int. Cl. B27b *5/36, 25/04*
U.S. Cl. 143—6 H **5 Claims**



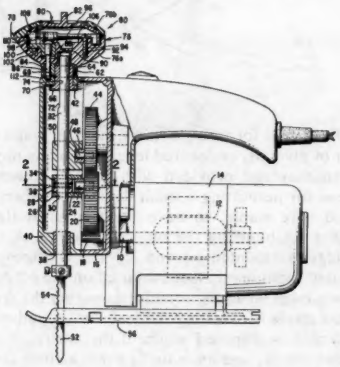
A saw assembly for multiple cutting of a workpiece, for example, miter and kerf cuts for splines for preformed door jamb assembly trim comprising a main frame, a first, fixed table support including a movable miter saw and a movable kerf saw, a second, movable carriage having another movable miter saw and another movable kerf saw, manual or motor means for moving the carriage with respect to the first table, a brake for locking the carriage in a predetermined position, a reciprocating conveyor arrangement to carry workpieces through the machine, and a hopper for storing workpieces to be fed to the conveyor. Each miter saw may be adjusted in a vertical and horizontal plane. Each workpiece is stagger-fed through the invention by means of the conveyor cooperating with clamp means, programmed to lock the workpiece in position as it is sawed, first by the miter saws, and then by the kerf saws. A kickout cylinder and piston is located adjacent each miter saw to move the workpiece quickly away after one pass of the saw to prevent tearing of the workpiece.

3,665,983

SABRE SAWS WITH ANGULARLY ADJUSTABLE SWIVEL SAW BARS

Robert W. Wagner, Easley, S.C., and John McLaughlin, Raleigh, N.C., assignors to The Singer Company, New York, N.Y.

Filed Dec. 15, 1970, Ser. No. 98,251
Int. Cl. B27b *19/08*
U.S. Cl. 143—68 F **4 Claims**



A sabre saw is provided with means for driving the saw bar in a linear reciprocatory motion from a rotary electric motor, while at the same time, permitting the saw bar to be manually rotated or selectively locked in position about its own axis to set the cutting edge of the saw blade in different angularly oblique positions relative to the line of movement of the tool. A control knob is fixedly connected to a journal bushing held captive in the housing, but free to rotate therein. The journal bushing has a central "D" aperture through which extends the slabbed upper end of the saw bar. The saw bar slides up and down within the journal bushing and its angular position is controlled by the angular position of the journal bushing which is caused to be rotated by the control knob. A control bar is operatively secured to the control knob to selectively cam a control arm in a locked or unlocked position. The control arm carries a spring-biased locking pin which in locked position will engage one of a plurality of holes set in the housing at predetermined angular positions corresponding to the desired angular position of the cutting edge of saw blade. With the control bar in the unlocked position, the control knob can be manually manipulated so as to suitably position the cutting edge of the saw blade, as in scroll cutting.

3,665,984

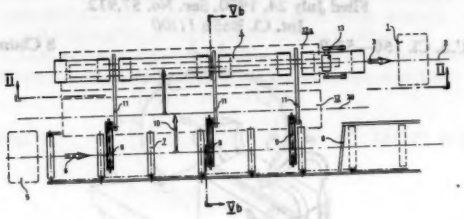
LOG ADJUSTING AND ALIGNING DEVICE

Bo Ingemar Ackerfeldt, Stockholm, Sweden, assignor to USNR Forest Industries, Inc., Portland, Oreg.

Continuation of application Ser. No. 779,102, Nov. 26, 1968, now abandoned. This application Aug. 19, 1970, Ser. No. 65,005
Int. Cl. B27b *31/06*
U.S. Cl. 143—157 R **25 Claims**

At a sawmill a device at the input side of the sawmill for adjusting automatically a log or a similar elongated object to be sawn relative to the center line or sawing line through the sawing unit so that a straight line through the centers of the end surfaces of the log becomes parallel to and coincident with the sawing line, if the log is straight, but parallel to and transversely offset from the sawing line, if the log is curved or

bent, said transverse offset having a direction opposite to the direction of the curve or bow in the log and a magnitude



which is a predetermined proportion of the height of the curve or bow in the log.

3,665,985

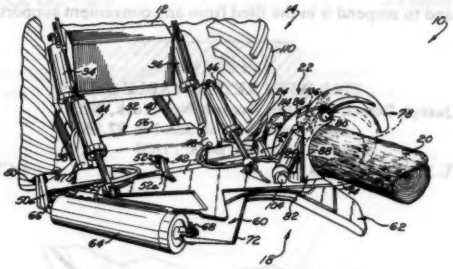
TREE HARVESTING APPARATUS

Idas B. White, Blountstown, Fla., assignor to Eaton Yale & Towne Canada Limited, London, Ontario, Canada

Filed June 29, 1970, Ser. No. 50,593

Int. Cl. A01g *23/02*

U.S. Cl. 144—34 E **7 Claims**



An improved tree harvesting apparatus is adapted to be mounted on a vehicle and includes a shear assembly for severing a tree. A grapple is mounted on a common base with the shear assembly and is selectively operable to grip a severed or felled tree. A single set of positioning cylinders is selectively operable to move both the shear assembly and grapple relative to the ground to facilitate positioning them in a desired relationship with a tree which is to be either severed or gripped. Another set of positioning cylinders is selectively operable to raise both the shear assembly and grapple to a nonoperating or over-the-road position.

3,665,986

JIG FOR CABINET DOOR CONSTRUCTION

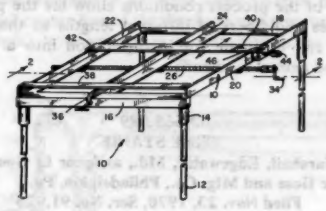
Jimmie Johnson, General Delivery, Ketchum, Okla.

Filed Oct. 2, 1969, Ser. No. 863,249

Int. Cl. B25h *1/02*

U.S. Cl. 144—288 **2 Claims**

A jig for holding doors during a work operation thereon and comprising a substantially rectangular frame supported at a predetermined elevation, with door supporting means provided on the frame and having fixed means for receiving an edge of the door thereagainst. Movable means is carried by the frame for engagement with an oppositely disposed edge of the door with respect to the edge against the fixed means, and means cooperates with the movable means for securely retaining the door between the movable means and fixed means. Means is also carried by the frame for spanning



the upper surface of the door disposed in the door supporting means.

ERRATUM

For Class 144—288 A see:
Patent No. 3,665,989

3,665,987

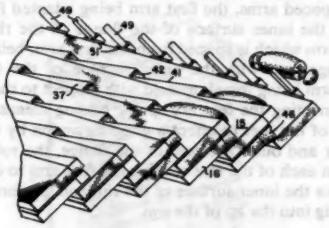
SHUFFLE FEED POSITIONER

Ralph K. Daugherty, San Jose, Calif., assignor to Genevieve I. Hanscom and Genevieve I. Hanscom, Robert Magnuson, Lois J. Thomson, as Trustees of the Estate of Roy M. Magnuson, part interest to each

Original application June 13, 1968, Ser. No. 736,861, now Patent No. 3,584,735. Divided and this application Sept. 2, 1970, Ser. No. 68,926

Int. Cl. A23n *15/04*

U.S. Cl. 146—81 R **3 Claims**



A shuffle feed structure for feeding articles which require trimming of the ends, in which the article advancing faces of the shuffle members include a series of wedge-shaped surfaces for feeding and orienting the articles (such as pickles) so that each article rests against one of the inclined faces of the shuffle feed member and abuts the end face of one of the wedges. During the last step of movement of the shuffle feed the articles are carried through a pair of trimming knives which cut off the ends of the pickle so that the middle segment of each pickle is cut to a uniform length.

3,665,988

PROCESS FOR PRODUCING GRANULAR AND FIBROUS COLLAGEN DISPERSIONS

Nicholas C. Aceto, Roslyn; Joseph Naghski, and Michael Komanowsky, both of Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Mar. 31, 1970, Ser. No. 24,327

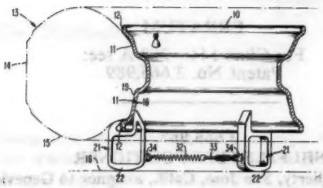
Int. Cl. A23l *1/44*

U.S. Cl. 146—227 **2 Claims**

A collagen granule is prepared from unhaired hides by cutting the hide into long, thin strips, recutting the strips and comminuting the recut strips. Collagen fibers are prepared

from the granule by shearing in a disc mill. Since no added water is required in the process, the solids content of the product is virtually the same as that of the original hide. The flexibility of the process conditions allow for the production of granules and fibers of different lengths so that collagen products can be made for incorporation into a variety of human and animal foodstuffs.

3,665,989
TIRE STAND
Don J. Marshall, Edgewater, Md., assignor to Goodall Semi-Metallic Hose and Mfg. Co., Philadelphia, Pa.
Filed Nov. 23, 1970, Ser. No. 91,926
Int. Cl. B25h *5/00*
U.S. Cl. 144—288 A **10 Claims**

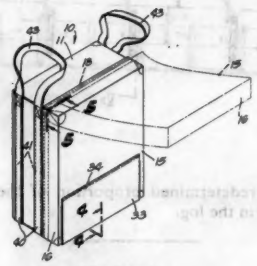


This patent discloses a tire stand for supporting a tire rim, the rim being conventional in that it includes a radially extending peripheral flange portion upon which, for example, an automotive or truck tire may be mounted. The tire stand includes a plurality of feet each of which comprise a rounded base portion, a body portion and a rim seating means which extends from the body portion, the seating means including a pair of spaced arms, the first arm being adapted for engagement of the inner surface of the flange of the rim and the second arm which is spaced from the first arm, being adapted for engagement with the outer surface of the flange, the second arm being foreshortened with respect to the first arm. Interconnecting the feet are spring biasing means which act on each of the feet to effect a gripping action by the feet on the inner and outer surfaces of the flange, the rotational effect upon each of the feet causing the first arm to dig into the interior or the inner surface of the rim and the foreshortened arm to dig into the lip of the rim.

3,665,990
GUN STOCK COVER
Chester W. Hefner, Jr., 2509 Wallis, Overland, Mo.
Filed May 18, 1970, Ser. No. 38,234
Int. Cl. B65d *65/02*
U.S. Cl. 150—52 R **4 Claims**

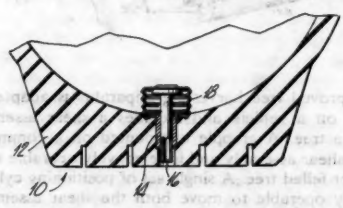
A cover for a gun stock comprising a body constructed of a multiplicity of panels sewn or otherwise united, and being contoured for snugly receiving the stock so as to be adapted for maintenance thereon during periods of use, as well as disuse, of the gun. Said cover is provided with a line of opening in its normally downwardly presented portion to permit ready application of the cover upon the gun stock and equally facile removal therefrom; there being closure means provided with said line of opening.

3,665,991
PROTECTIVE ENCLOSURE FOR TEST INSTRUMENT
George W. Gillemot, 2331 20th St., Santa Monica, Calif., and John T. Thompson, 244 Loring St., Los Angeles, Calif.
Filed July 24, 1970, Ser. No. 57,912
Int. Cl. B65b *11/00*
U.S. Cl. 150—52 R **8 Claims**



A weather-proof flexible enclosure for electrical test equipment commonly used in the field. The enclosure or casing has a built-in window of flexible transparent material with sufficient excess to permit the user to manipulate, from the exterior thereof, control elements on a panel of test equipment housed in the casing. Loops of strip material secured to the enclosure serve to reinforce the saem as well as to carry and to suspend it in the filed from any convenient support.

3,665,992
TIRE WITH RETRACTABLE STUDS
Joseph Rossel, 253 10th Avenue, New York, N.Y.
Filed Nov. 9, 1970, Ser. No. 87,962
Int. Cl. B60c *11/00*
U.S. Cl. 152—208 **1 Claim**



A tire with retractable hollow studs and pressure sensing means for extending the studs when the pressure in the tire exceeds a selected pressure and for retracting the studs at a second and lower pressure.

3,665,993
PNEUMATIC VEHICLE TIRE
Hermann Wittneben, Hannover, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany
Filed Dec. 16, 1970, Ser. No. 98,711
Claims priority, application Germany, Dec. 17, 1969, P 19 63 260.1
Int. Cl. B60c *9/02, 9/20*
U.S. Cl. 152—356 **2 Claims**

A pneumatic vehicle tire with a carcass having twisted strength carriers extending at least approximately at a right angle with regard to the circumferential direction of the tire

in which the number of twists of the strength carriers within the region of the side walls of the tire is considerably less

than the number of the twists of the strength carriers within the region radially inwardly of the belt of the tire.

3,665,994

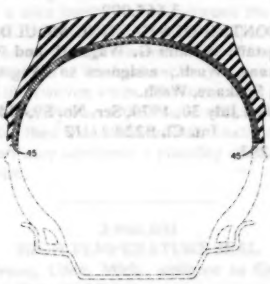
TIRE CORD, ETC.

Frederick J. Kovac, Bath, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Original application Apr. 24, 1968, Ser. No. 748,136, now Patent No. 3,553,307, which is a continuation-in-part of application Ser. No. 376,750, June 22, 1964, now abandoned. Divided and this application May 20, 1970, Ser. No. 39,051

Int. Cl. B60c *9/02;* **D02g** *3/48*

U.S. Cl. 152—359 **2 Claims**



An improved tire and tire cord which is made by treating polyester cord reinforcement by subjecting the tire cord to a first stage of heat treatment at a temperature in excess of 440° F. and for a period of 30 to 70 seconds while stretching the cord from 2 to 10 percent of its original length, followed by a second stage of heat treatment at a temperature also in excess of 440° F., and preferably higher than the temperature of the first stage, with an exposure time of 30 to 70 seconds and with the cord being permitted to shrink by 30 to 50 percent of the amount that it was stretched in the first stage treatment. An improved tire cord results.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,665,995

DIAPHRAGM BEAD SPREADER

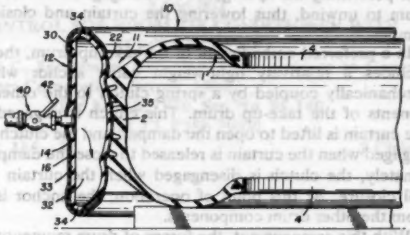
Irvin E. Middleton, Jr., Akron, Ohio, assignor to The General Tire & Rubber Company

Filed Nov. 4, 1969, Ser. No. 873,876

Int. Cl. B60c *25/12*

U.S. Cl. 157—1.1 **6 Claims**

The disclosure is concerned with an improved annular, expansible diaphragm for spreading the beads of a pneumatic tire for purposes of mounting the tire on a rim and/or inserting an inner tube, if desired. The diaphragm features an outer, annular, restraining layer comprising at least two fabric plies, with oppositely directed mutually parallel reinforcing cords disposed at an acute angle relative to the circumferential center-line of the diaphragm. An inner, annular, tread engaging layer comprises at least one fabric ply comprising mutually parallel reinforcing cords disposed at an angle of substantially 90° relative to the circumferential center-line of the diaphragm. An annular, tubular, air-tight bladder member is sandwiched between the outer and inner layers, which is inflatable through a valve disposed in the outer diameter of the tube.



3,665,996

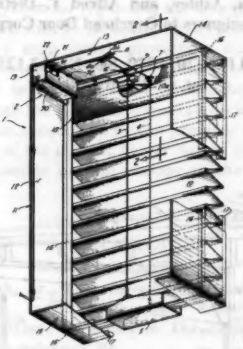
CLOSURE OPERATOR

Frank D. Roberts, North Reading, Mass., assignor to Rixson Inc., Franklin Park, Ill.

Filed Dec. 8, 1969, Ser. No. 882,827

Int. Cl. E05f *15/20*

U.S. Cl. 160—1 **10 Claims**



A closure operator to effect remote, failsafe opening and closing of a damper, particularly a multi-fold or interlocking slat curtain damper.

A frame or shell envelops a damper curtain which is capable of opening and closing an air passage through the frame or shell. A housing containing an electromechanical curtain operator is optionally positioned within or outside the frame or shell. The curtain is lifted by a tray connected to two wire cables, in response to the winding of the cable upon a take-up drum located within the housing.

The drum rotates, when a driven spur gear coupled to the drum is engaged with a driving spur gear, by pivoting a motor which carries the driving gear.

This pivot action is effected by lifting a pivoting arm which is connected to the motor. This arm is lifted whenever a solenoid and its associated plunger are actuated to lift a lever upon which the arm rides. An electromagnet armature fixed to the lever is held by an electromagnet when the lever is lifted so that the motor is latched in the pivoted position as required.

Thus, if the motor is pivoted so that the spur gears are driven into engagement, the take-up drum is rotated to wind the cable and elevate the curtain.

Upon occurrence of (1) a manual switch operation to effect damper closure, (2) a power failure, (3) circuit malfunctioning, or (4) the detection of an undesired condition such as smoke or fire, the motor is released from its pivoted position permitting the spur gears to disengage. This allows the drum to unwind, thus lowering the curtain and closing the damper.

In a preferred embodiment of the take-up drum, the drum includes a relatively light-weight cable anchor which is mechanically coupled by a spring clutch to the other components of the take-up drum. This clutch is engaged when the curtain is lifted to open the damper; and the clutch is also engaged when the curtain is released to close the damper. Ultimately, the clutch is disengaged when the curtain attains full closure. At this point of operation, the anchor is freed from the other drum components.

With this arrangement, the forces of drum momentum acting upon the cable and tending to rewind the cable in the opposite direction when the curtain is released are substantially minimized because the mass of the anchor is freed from the other components. Without this feature the cable is excessively flexed and strained and, therefore, has an unsatisfactory operational life. Additionally, other operator components, such as those directly related to the cable will also have a reduced operational life due to forces generated by the tendency to rewind the cable.

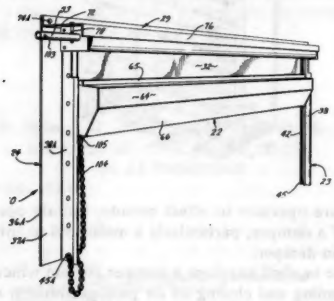
An air vane latch is also optionally associated with the curtain operator to delay curtain closure until the forces generated by the air passing through the damper have been reduced to permit safe lowering of the curtain.

3,665,997

ADJUSTABLE DOCK SEAL ASSEMBLY

Vernon O. Smith, Ashley, and Alfred T. Dietrich, Marion, both of Ohio, assignors to Overhead Door Corporation, Dallas, Tex.

Filed Feb. 20, 1970, Ser. No. 13,128
Int. Cl. E06b 7/00
U.S. Cl. 160—41 **13 Claims**



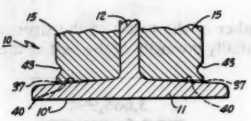
A dock seal assembly for an opening in a wall, said seal assembly having a resiliently flexible head seal supported by upright, parallel track means mounted upon the wall adjacent the sides of said opening near the upper end thereof. Spring-biased annular means is supported upon the wall for rotation about a horizontal axis near the upper end of said opening and is connected to the head seal by sheet means which covers said upper end of the opening when the head seal is lowered. The sheet means also serves to raise the head seal when it is released from an anchored, lowered position.

3,665,998

PROCESS FOR FORMING A MULTI-METALLIC RAIL DEVICE

Thomas A. Nowak, Veradale, Wash., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Original application July 5, 1968, Ser. No. 742,586, now Patent No. 3,544,737, dated Dec. 1, 1970, which is a continuation-in-part of application Ser. No. 666,654, Sept. 11, 1967, now abandoned. Divided and this application May 28, 1970, Ser. No. 9,288
Int. Cl. B22d 11/12
U.S. Cl. 164—76 **8 Claims**



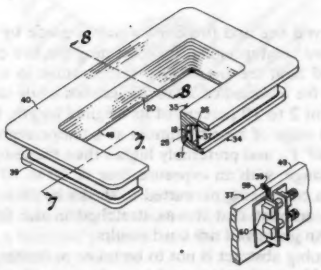
This invention relates to an improved process for producing a multi-metallic rail device wherein the different metal components making up the rail device are permanently secured together in intimate interfacial and electrical contact as well as a multi-metallic rail device produced by the said process.

3,665,999

CONTINUOUS CASTING MOULD

Frank E. Wagstaff; William G. Wagstaff, and Paul H. May, all of Spokane, Wash., assignors to Wagstaff Machine Works, Inc., Spokane, Wash.

Filed July 30, 1970, Ser. No. 59,444
Int. Cl. B22d 11/12
U.S. Cl. 164—283 **6 Claims**



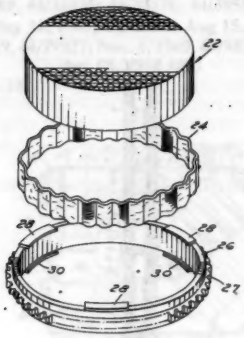
An improved compound, disassemble, mould, for the continuous vertical casting of metals, of the type having an internal annular chamber divided into concentric annular parts for coolant dispersal. The structure provides a separate band-like septum divider and a water dispersing skirt having internal supports to prevent differential change in water dispersal upon thermally caused changes in the mould configuration. One water supply system disclosed enters from only one end of the mould with aid of corner deflectors. The improvements may be embodied in either bottom or side opening moulds.

3,666,000

TORQUE TRANSMISSION SYSTEM FOR A GAS TURBINE HEAT EXCHANGER

Joab J. Blech, Oak Park, and Antoni Paluszny, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 19, 1970, Ser. No. 81,949
Int. Cl. F28d 19/04
U.S. Cl. 165—8 11 Claims



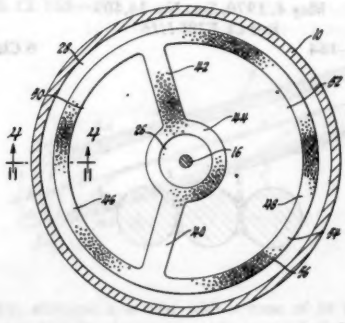
A torque transmission system for a gas turbine heat exchanger assembly comprising a rotary heat exchanger formed of a ceramic honeycomb structure and driven by annular metal driving means coupled to the heat exchanger periphery by a wire mesh located between the inner surface of the annular driving means and the periphery of the heat exchanger. The wire mesh transmits torque from the annular metal driving means to the heat exchanger and may comprise a plurality of interwoven wires. The wire mesh may be corrugated and preferably has a thermal coefficient of linear expansion greater than that of the annular metal driving means. The wire mesh may comprise a plurality of plaited layers of interwoven wire.

3,666,001

HIGH TEMPERATURE SEAL

John N. Johnson, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1970, Ser. No. 62,257
Int. Cl. F28d 19/00
U.S. Cl. 277—234 4 Claims



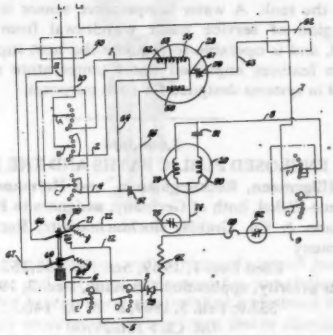
A rubbing contact fluid seal, particularly suitable for use in a gas turbine engine rotary regenerator, comprising a reticulate metal facing layer bonded to a base member and adapted for rubbing contact with the regenerator, the facing layer having disposed in the pores thereof a seal material consisting of, by weight, 72 to 75 percent chromite powder and potassium silicate equivalent to 25 to 28 percent of an aqueous potassium silicate solution containing about 29.1 percent, by weight, potassium silicate which material is bonded in and to the facing layer by curing at 500° F.

3,666,002

CONTROL FOR ROOM AIR CONDITIONER WITH ELECTRIC HEAT

Donald C. Ferdelman, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 2, 1970, Ser. No. 86,140
Int. Cl. F25b 29/00
U.S. Cl. 165—29 2 Claims



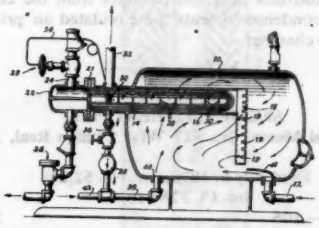
A control system for regulating the energization of an electric heater used with an all season type room air conditioning unit. A rotary snap switch provides a multiple circuit arrangement having a common manual selector operating means which selects either an electric heating cycle with medium or high fan speed or a cooling cycle with low, medium or high fan speed. The switch provides for complete circuit isolation of the electric heater during the cooling phases to prevent possible current leakage to the air conditioning cabinet.

3,666,003

WATER HEATER UNIT

John A. Clark, Jr., East Stroudsburg; Lemuel J. Morgan, Stroudsburg, both of Pa., and Robert F. Kirschner, Stoughton, Mass., assignors to The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.

Filed May 28, 1970, Ser. No. 41,401
Int. Cl. B60h 1/00
U.S. Cl. 165—39 6 Claims



A water heating and supply system is provided, comprising in combination, a water storage tank having a cold water supply inlet and a heated water service outlet and supply

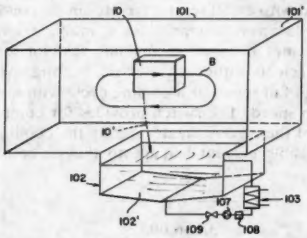
conduit system, and a heater shroud extending into the upper level of the tank; the shroud being arranged at its inner end in closed fluid flow communication with an intake manifold means drawing water from substantially throughout the vertical range of the interior of the tank. A heater is disposed within the shroud and operates under control of a heat supply regulator. A by-pass circulating conduit system is provided including a continuously operating pump having its intake in fluid communication with the interior of said shroud adjacent the outer end thereof and its discharge arranged to deliver water into the bottom level of said tank. The return from the heated water supply system is arranged in open communication with said by-pass conduit system, Hence, whenever water is withdrawn from the service outlet, replacement cold feed water moves through said supply inlet and is thereby mixed into the water being circulated throughout the entire vertical extent of the tank from which the intake manifold draws water from substantially all levels within the tank. A water temperature sensor is disposed in the region of service water withdrawal from the heater shroud, and is operable to regulate the heat supply. The invention features improved water temperature stratification control in systems designed for such purposes.

3,666,004

ENCLOSED PUBLIC BATHS AND THE LIKE

Hans Hilgemann, Recklinghausen, and Hermann Gettmann, Wanne-Eickel, both of Germany, assignors to Fa. Hans Hilgemann & Co. GmbH, Hochlarmarkstr, Recklinghausen, Germany

Filed Dec. 1, 1969, Ser. No. 881,152
Claims priority, application Germany, Dec. 3, 1968, P 18 12 353.0; Feb. 3, 1969, P 19 05 141.3
Int. Cl. F25b *29/00*
U.S. Cl. 165—19 **14 Claims**



An enclosed bath system, having a bath chamber in which a body of water has its surface exposed to the air in the chamber. A heat pump, having an evaporator, a condenser and a circulating primary heat-transfer fluid carrying thermal energy absorbed at the evaporator to the condenser, circulates air from the chamber into heat-exchanging relation with the evaporator and the condenser successively whereby the evaporator abstracts heat and moisture from the circulated air and the condenser reheats the circulated air prior to its return to the chamber.

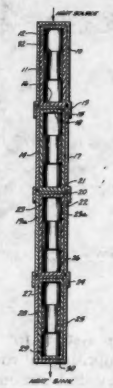
3,666,005

SEGMENTED HEAT PIPE

Robert David Moore, Jr., 817 West Camino Real, Arcadia, Calif.

Filed July 6, 1970, Ser. No. 52,249
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **2 Claims**

An improved heat pipe capable of conveying a greater heat flux than a conventional heat pipe is provided in practice of this invention. A heat pipe transfers heat from a heat source to a heat sink in the form of latent heat of vaporization of a fluid within the heat pipe. Hot vapor transfers heat from the heat source to the heat sink. Condensed liquid is returned from heat sink to the heat source through porous capillary material due to surface tension forces. The heat flux obtainable is limited by the available flow of returning liquid. In the improved heat pipe, the flow paths for liquid and vapor are serially segmented by impermeable barriers transverse to the direction of heat flow so that the distance of liquid flow in each segment is minimized. In zero gravity the heat flux obtainable is approximately proportional to the number of seri-



al segments N into which the heat pipe is divided, that is, if the heat is transferred serially through N segments approximately N times the heat flux is possible as compared with a conventional heat pipe of the same overall dimensions. When operating against a gravity head, the maximum heat flux is about N^2 times the heat flux of a conventional heat pipe. Thus a heat pipe segmented into 10 serial segments has approximately 10 to 100 times the maximum heat flux capacity of an unsegmented heat pipe of the same cross section and total length.

3,666,006

HEAT EXCHANGER

Emery I. Valyi, Riverdale, N.Y., assignor to Olin Corporation

Continuation-in-part of 754,995, Aug. 23, 1968, now Patent No. 3,539,672, dated Nov. 10, 1970. This application May 4, 1970, Ser. No. 34,409
Int. Cl. F28f *1/16*
U.S. Cl. 165—164 **6 Claims**

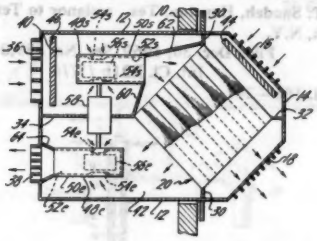
An improved heat exchanger utilizing bonding metal particles, especially aluminous, cuprous or ferrous particles. The particles are bonded together and to an imperforate metal member utilizing a thin coating of resin as the bonding medium.

3,666,007

APPARATUS FOR EFFECTING CONTINUOUS AND SIMULTANEOUS TRANSFER OF HEAT AND MOISTURE BETWEEN TWO AIR STREAMS

Masataka Yoshino; Akima Kamiya; Nin Ogawa; Atsushi Oguri, all of Naka-sugawa, and Shigeo Muramatsu, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1970, Ser. No. 20,302
Claims priority, application Japan, Mar. 20, 1969, 44/21477; Apr. 30, 1969, 44/33375; 44/33376; 44/39556; May 8, 1969, 44/35420; May 12, 1969, 44/43466; Aug 15, 1969, 44/77524; Aug. 20, 1969, 44/79027; Nov. 4, 1969, 44/88311
Int. Cl. F28f *3/00*
U.S. Cl. 165—166 16 Claims



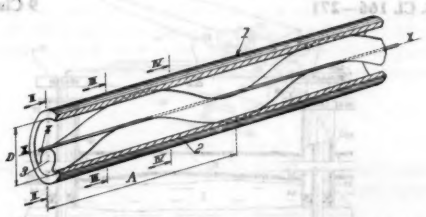
Apparatus for effecting continuous and simultaneous transfer of both heat and moisture between two air streams comprises a housing having therein a plurality of heat and moisture transfer surfaces statically disposed in superposed and spaced-apart relationship defining therebetween static flow paths, and means for including air from one locale through alternate ones of the flow paths to another locale and for discharging air from said another locale through the remaining flow paths to said one locale. The heat and moisture transfer surfaces are each composed of a material, such as Japanese paper, which is sufficiently heat conductive and permeable to moisture to continuously and simultaneously effect both heat and moisture exchange between the inducted and discharged air.

3,666,008

HEATING ELEMENTS FOR HEAT-TREATING THREADS

Guy Jean Batsch, Aubenas, France, assignor to Societe Civile Textile Dite Socitex, Lyon, France

Filed Apr. 2, 1970, Ser. No. 32,586
Claims priority, application France, Apr. 30, 1969, 6913804
Int. Cl. F28g *1/40*
U.S. Cl. 165—177 11 Claims



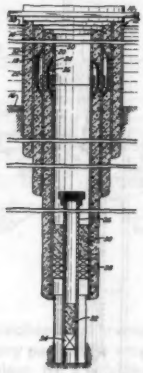
The element is a tube with a zone of its inner wall extended radially close to its axis over a helicoidal track extending through the tube. The thread can thus be passed axially through the tube and heated by conduction through the zone, whilst being simultaneously heated by radiation from the tube wall and by convection from a hot fluid circulated through the tube.

3,666,009

METHOD AND APPARATUS FOR SHUTTING IN OFFSHORE WELLS

Virgil D. Stone, Anchorage, Alaska, assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1970, Ser. No. 5,319
Int. Cl. F16l *11/12*; E21b *33/035*
U.S. Cl. 166—.5 8 Claims



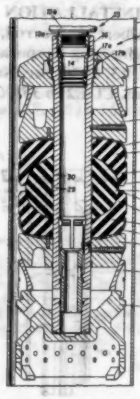
An offshore exploratory well is plugged, cut off just above the mud line, and left until equipment for completion of the well is ready. A cementing sub installed just above the mud line in one or more casing strings has a sleeve surrounding a joint in the casing strings and isolating that joint from fluids in the surrounding annulus between casing strings. Before leaving the well, the casing strings are cut off through the cementing subs above the joint within the subs to leave a portion of casing connected in the joint. That portion of casing can be removed to leave threads for tying back into the well.

3,666,010

PACKER SLEEVES

Allen E. Harris, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed June 11, 1970, Ser. No. 45,464
Int. Cl. E21b *33/128*, *33/129*
U.S. Cl. 166—134 6 Claims



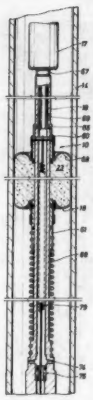
This invention relates to resilient packer sleeves which when expanded laterally in a well, provides a seal separating the well into the isolated sections.

3,666,011

APPARATUS FOR PLUGGING WELL BORES WITH HARDENABLE FLUENT SUBSTANCES

Nevyl G. Owens, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 13, 1970, Ser. No. 89,332
Int. Cl. E21b *33/127*
U.S. Cl. 166—187 12 Claims



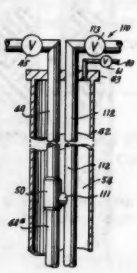
As a preferred embodiment of the invention disclosed herein, a tubular bag sealingly mounted around an elongated body is operatively arranged to be expanded into engagement with the walls of a well bore by discharging thereinto an initially fluent hardenable substance contained in a selectively operable displacement assembly releasably coupled to the body. Biasing means are uniquely arranged for initially retaining the bag in a collapsed position along the body and then selectively imposing opposed axial forces against the expanded bag to depress the ends of the bag inwardly. In this manner, the biasing means functions further to utilize the unbalanced pressure forces acting on the tool for urging the bag outwardly into anchoring engagement with the well bore wall as the fluent substance solidifies.

3,666,012

WELL CROSS-OVER APPARATUS FOR SELECTIVE COMMUNICATION OF FLOW PASSAGES IN A WELL INSTALLATION

Phillip S. Sizer, and Albert W. Carroll, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 23, 1970, Ser. No. 91,751
Int. Cl. E21b *33/00*
U.S. Cl. 166—224 23 Claims



A well flow system, including one or more flow conductors disposed in a well having a casing annulus, means interconnecting the conductor or conductors and/or annulus, and a fluid-actuated valve in at least one of the flow conductors for selectively communicating the conductor or conductors and/or the annulus of the well responsive to a pressure differential applied across the valve and controlled from the surface. The flow system is adapted to well producing and well treating procedures. A number of different flow conductor, well annulus, and valve arrangements are shown with provision in each system disclosed for hydraulic control of a down-hole valve to communicate selected combinations of flow passages of the conductors and the well annulus.

3,666,013

REINFORCED CONCRETE STABILIZER FOR AN INSULATED TUBING STRING IN A SECONDARY RECOVERY STEAM STIMULATION OPERATION

Faud T. Saadeh, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,057
Int. Cl. E21b *17/10*
U.S. Cl. 166—241 7 Claims

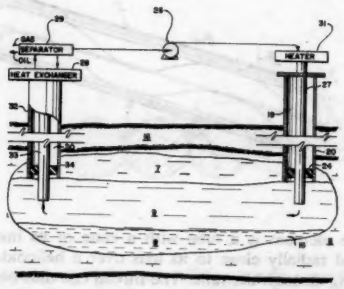
A concrete stabilizer with reinforcing means therein and having insulating properties is mounted on a tubing collar of an insulated tubing string used for steam stimulation in a secondary recovery operation.

3,666,014

METHOD FOR THE RECOVERY OF SHALE OIL

Thomas N. Beard, Denver, Colo., assignor to Shell Oil Company, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,699
Int. Cl. E21b *43/20, 43/24, 43/26*
U.S. Cl. 166—271 9 Claims



A method for recovering shale oil from a subterranean oil shale formation by forming a rubbled zone therein and em-

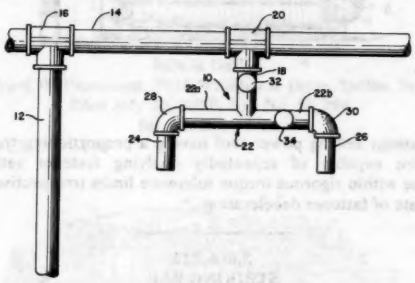
placing first and second layers of fluid therein. The first fluid layer overlies the second fluid layer which is of a higher specific gravity and is largely immiscible therewith. A shale oil-extractive fluid of a specific gravity intermediate that of the first two fluids is then circulated through the zone between the first and second layers and in contact therewith until shale oil is entrained in the shale-oil extractive circulating fluid layer. Shale oil is then recovered from the shale oil-extractive fluid.

3,666,015

FLUID FLOW CONTROL DEVICE

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Sept. 15, 1970, Ser. No. 72,370
Int. Cl. A62c *35/00*
U.S. Cl. 169—5 **26 Claims**



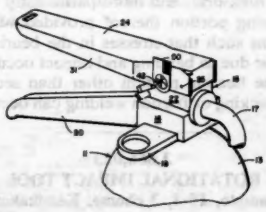
A device for controlling the flow of fluid, wherein a fluid distributing member is connected to a source of fluid in response to a predetermined temperature condition to establish a fluid flow path in the fluid distributing member. An additional fluid flow path is established in the fluid distributing member in response to a predetermined fluid pressure occurring therein. A fixed fire extinguishing system incorporating the above fluid flow control device.

3,666,016

SAFETY FEATURE FOR FIRE EXTINGUISHERS

Roger Q. Estes, C/O Shelledy 319 Peyton Bldg., Spokane, Wash.

Filed Apr. 1, 1971, Ser. No. 130,083
Int. Cl. A62c *13/00*
U.S. Cl. 169—31 R **9 Claims**



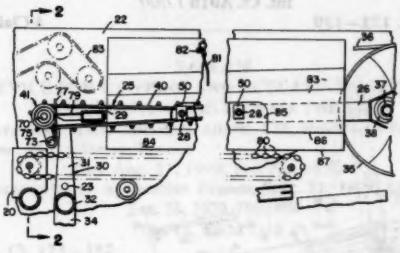
A safety feature is described for preventing the inadvertent operation of a fire extinguisher during normal handling but which will enable the fire extinguisher to be operated when desired. The safety feature includes a pull pin that is made of a frangible material that has sufficient shear strength characteristics to withstand normal handling forces but which will break when forces are applied commensurate with the intentional operation of the extinguisher. A frangible seal means is mounted on the end of the pull pin to prevent the pin from being pulled without first breaking the seal means.

3,666,017

SEPARATOR FOR TOMATO HARVESTER AND THE LIKE

Lauren W. Gates, Rio Vista, and Michael J. Hartwig, Walnut Creek, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Original application May 1, 1968, Ser. No. 725,874. Divided and this application July 2, 1970, Ser. No. 60,974
Int. Cl. A01d *27/00*
U.S. Cl. 171—27 **4 Claims**



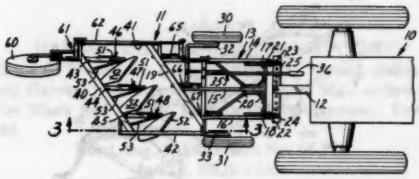
A separator for mechanical harvesters of the type where the fruit or other heavy part of the crop is separated from the remainder of the plant by a shaking action. A generally rectangular frame has a front end where harvested plants are introduced and a rear end where they leave. A rockshaft supports the front end of the frame for substantially pure fore-and-aft movement, while crank means support the rear end of the frame and drive it as a unit in a generally circular motion involving both vertical and fore-and-aft components. There is a plurality of pulleys at each end of the frame, those on the rear end being mounted on the crank pin and driven by the crank means, those on the front end being idlers individually spring mounted. The pulleys cany a plurality of closed-loop belts with upwardly extending projections for engaging harvesting plants and moving them from the front to the rear of the frame. A collecting conveyor beneath the frame catches the fruit shaken from said plant and conveys it elsewhere. Thus, the more easily loosened fruit is shaken off by fore-and-aft shaking while the fruit more difficult to loosen is shaken off by the gradual introduction of vertical movement as the crop moves rearwardly. The belt, pulleys, and belt guides are also novel in structure.

3,666,018

GANG-PLOW

Harold R. Trahms, Route #2, Janesville, Minn.

Continuation-in-part of application Ser. No. 533,496, Mar. 11, 1966, now abandoned. This application Nov. 5, 1969, Ser. No. 874,199
Int. Cl. A01b *15/14*
U.S. Cl. 172—669 **5 Claims**



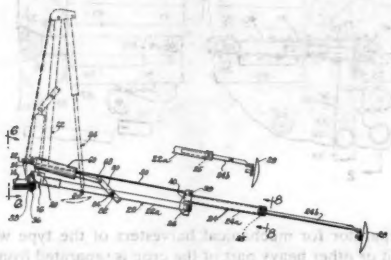
A gang-plow having a generally transversely extending backbone spaced rearwardly from a main wheeled frame, a plurality of forwardly extending beams affixed to the backbone adjacent the rear end thereof and having downwardly and forwardly extending standards affixed

thereto adjacent the forward end, and plow bottoms affixed to the lower forward ends of the standards so as to be oriented beneath the space between the frame and the backbone.

3,666,019
ROW MARKING APPARATUS

Laurel R. Yeske, Rockford, Ill., assignor to J. I. Case Company

Filed Oct. 7, 1969, Ser. No. 864,315
Int. Cl. A01b *17/00*
U.S. Cl. 172—130 4 Claims



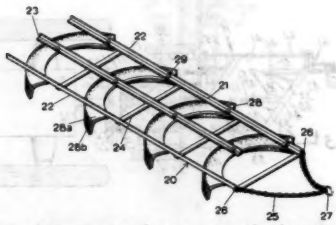
A row marking apparatus including first and second row markers individually pivoted at one end on a tool bar of a tractor. Each marker is pivoted between raised and lowered positions by a ram having its cylinder connected to the tool bar and its piston rod pivotally connected intermediate the ends of the associated row marker. The flow of fluid to and from the ram is automatically controlled by a flow control valve which provides first and second isolated flow paths between a main valve and the rams. The flow paths cooperate with the rams to alternatively (1) sequentially raise and lower respective markers or (2) raise and lower an individual lowered marker.

Each row marker is preferably formed in two sections which are pivotally interconnected at adjacent ends and which are moved between folded and end-to-end relation when the row marker is moved between the lowered and raised positions. This movement is accomplished by a cable having one end connected to the tool bar and an opposite end connected to the second section and an intermediate portion of the cable cooperating with a guide located adjacent the pivotal connection for the sections.

3,666,020
DRAGS FOR SNOWMOBILE TRAILS

Robert V. Hess, Route #2, Deerbrook, Wis.

Filed Nov. 18, 1970, Ser. No. 90,619
Int. Cl. A01b *31/00*
U.S. Cl. 172—612 1 Claim

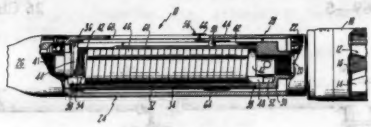


Apparatus for leveling and conditioning snowmobile trails having a substantially rigid elongate frame assembly and a series of resilient snow gathering and distributing scoops formed from sectors of pneumatic tire casings depending from the frame.

3,666,021
POWER TOOL HAVING PROPORTIONING TRANSMISSION

Hugh L. Whitehouse, Lyndhurst, Ohio, assignor to The Stanley Works, New Britain, Conn.

Filed May 13, 1970, Ser. No. 36,951
Int. Cl. B25b *23/14*
U.S. Cl. 173—12 24 Claims

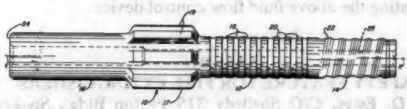


Fastener setting power tool having a proportioning transmission capable of repeatedly applying fastener setting torque within rigorous torque tolerance limits irrespective of the rate of fastener deceleration.

3,666,022
STRIKING BAR

Edward A. Bailey, RFD #2 Box 37, Newport, N.H., and James F. Ordway, 10 Floyd Ave., Lebanon, N.H.

Filed Nov. 23, 1970, Ser. No. 92,033
Int. Cl. E21c *7/00*, *15/00*
U.S. Cl. 173—80 10 Claims



A striking bar of a type utilized in a percussive tool, such as a hammer rock drill, and more particularly a striking bar having a bearing portion thereof provided with stress distributing means such that stresses in the bearing portion of the striking bar due to bending and impact occur primarily in sections of the bearing portion other than sections thereof where heat cracking or friction welding can occur.

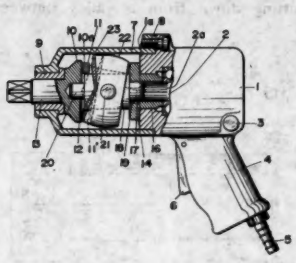
3,666,023
ROTATIONAL IMPACT TOOL

Yasuhisa Sakamoto, 15-1, 3 chome, Kaminakozato, Kito-ku, Tokyo, Japan

Filed July 23, 1970, Ser. No. 57,627
Claims priority, application Japan, July 30, 1969, 44/60168
Int. Cl. B25d *15/00*
U.S. Cl. 173—93.5 7 Claims

A rotational impact tool having two oppositely facing hammers on a rotatable hammer body and two oppositely facing anvils on an output shaft, a motor for rotating the hammer body selectively in either direction through a driving connection which ensures tilting of the hammer body so that the advancing hammer is held back, and a camming arrangement

which tilts the hammer body against the action of the driving connection to allow the advancing hammer to hit the corresponding anvil, thus producing a rotational impact on the output shaft.

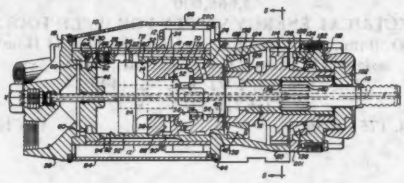


3,666,024

ROCK DRILL

Richard W. Beaumont, 3025 Wildflower Drive, Dallas, Tex.

Filed July 29, 1970, Ser. No. 59,290
Int. Cl. B25d 9/00
U.S. Cl. 173—105 **10 Claims**



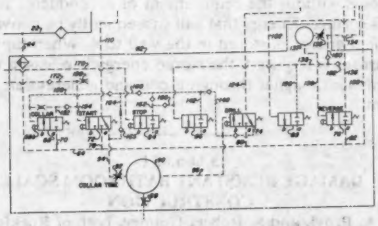
A rock drill wherein a piston is the only moving hammer part and such piston is movable without independent valve means or the like.

3,666,025

COLLARING TIMING CONTROL SYSTEM FOR ROCK DRILLS

Laurence B. Hanson, Pine, and Wallace W. Arthur, Denver, both of Colo., assignors to Gardner-Denver Company, Quincy, Ill.

Original application Mar. 20, 1969, Ser. No. 808,925, now Patent No. 3,561,542. Divided and this application Sept. 11, 1970, Ser. No. 71,405
Int. Cl. B25d 17/28; E21c 5/10
U.S. Cl. 173—112 **5 Claims**



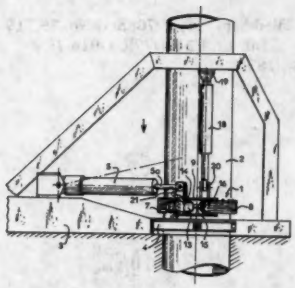
An automatic control system for a guide shell mounted rock drill including a control circuit having pneumatically operated valves for providing pressure fluid to the drill hammer, rotation motor and feed motor and for controlling drill hole flushing medium. Sensors mounted on the drill guide shell provide for reversal of the feed motor and reduced drill power upon reaching the forward end of the guide shell, and shutdown of the drill upon reaching the rearward end of the guide shell. The control circuit includes a series of control valves for selection, at will, by the drill operator of a particular operating sequence or condition of the drill. A control valve is included for providing an operating sequence which includes operation of the drill at reduced power for a predetermined period of time for collaring a drill hole. The control system also includes pressure proportioning valves for automatically regulating the feed motor pressure to be proportional to the drill percussion motor supply pressure.

3,666,026

DEVICE FOR GRIPPING AND ACTUATING A BORING TUBE, FOUNDATION PILE OR THE LIKE

Pierre Jean-Marie Theodore Allard, 178, Boulevard Francois 1er, 76, La Havre, France

Filed Aug. 21, 1970, Ser. No. 65,820
Claims priority, application France, Sept. 11, 1969, 6931009; Jan. 28, 1970, 7002958
Int. Cl. E02d 7/18
U.S. Cl. 173—152 **5 Claims**



A device for tightening and actuating a boring tube, and comprising a collar constituted by a first and a second chain links or sections interconnected through the medium of linking elements, the ends of said first link being secured directly to the said linking elements while the ends of said second link are adapted to be actuated respectively by traction means solid with the said linking elements, so as to ensure a uniform and accurate tightening of the collar on the tube by exerting a tractional action on both ends of said second chain link.

3,666,027

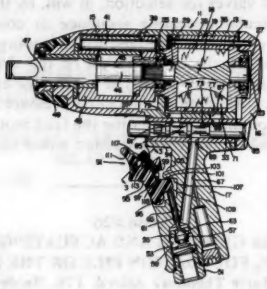
HANDLE AND TRIGGER CONSTRUCTION

William D. Sauerwein, Joppa; Robert A. Meloni, Baltimore, and Harvey J. Walter, Joppatown, all of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 1, 1970, Ser. No. 65,954
Int. Cl. B23b 45/04
U.S. Cl. 173—169 **5 Claims**

A portable tool including a housing having a rotary pneumatic motor disposed therein and coupled to a tool spindle. Compressed air is delivered to the motor by conduit means which includes passage means in a handle dependent from

the housing. A throttle valve is disposed within the handle and is controlled by a trigger pivoted upon the handle. The



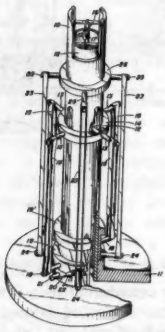
trigger and handle are provided with novel adjustable stop means to limit trigger movement.

3,666,028

CORING APPARATUS FOR TAKING SAMPLES OF THE OCEAN FLOOR

Michael L. Greene, Hillcrest Heights, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Sept. 25, 1970, Ser. No. 75,519
Int. Cl. E21b *1/00;* **G01n** *1/08*
U.S. Cl. 175—189 **3 Claims**



An apparatus for extracting a core from the ocean floor which includes a core tube that is held in a "cocked" position, and can be driven into the ocean floor by a set of elastic bands when the restraining cord is cut. An extracting collar, also held in a "cocked" position and powered by elastic bands is used to extract the core tube, with its core, from the ocean floor when collar's restraining cord is cut.

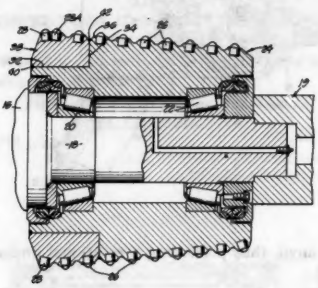
3,666,029

TUNNELING CUTTER GAGE RING REPLACEMENT

Robert L. Dixon, Whittier, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 23, 1970, Ser. No. 83,508
Int. Cl. E21b *9/12;* **E21c** *13/01*
U.S. Cl. 175—374 **6 Claims**

A rotary cutter for tunneling machines comprising one of a series of gage cutters about the periphery of a face plate, the outer or gage end of the gage cutters being subject to rapid deterioration resulting in wearing away of the metal of the body of the cutter and displacement of the hardened metal inserts around the gage end, a gage ring about the gage end being produced by cutting inwardly beneath the gage row and possibly one or more additional rows of hardened inserts, and then cutting down from a valley between rows of



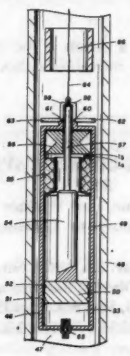
hardened inserts to the first described separation to provide a removable and replaceable gage ring portion on the cutter containing peripheral rows of hardened metal inserts in the same manner as the damaged gage ring portion being replaced.

3,666,030

ELECTRICAL ENERGY SUPPLY FOR WELL TOOLS

Floyd O. Bohn, and Russell A. McLaughlin, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 21, 1971, Ser. No. 114,924
Int. Cl. E21b *43/11, 29/02*
U.S. Cl. 175—4.56 **10 Claims**



A device for providing an electrical current to a downhole well tools without the requirement of a conductor from the earth's surface. Energy that will subsequently be converted to electrical energy is stored in the well tool. When the electrical current is required, the stored energy is released to drive a permanent magnet through a coil and generate an electric current.

3,666,031

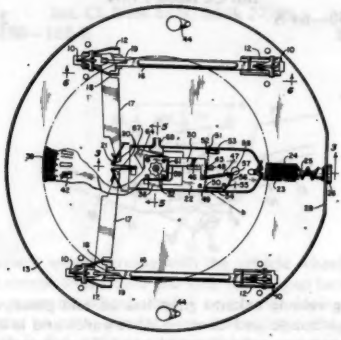
DAMAGE RESISTANT BATHROOM SCALE CONSTRUCTION

Mike A. Provi, and S. Robert Guinter, both of Rockford, Ill., assignors to The Brearley Company, Rockford, Ill.

Filed Apr. 10, 1970, Ser. No. 27,368
Int. Cl. G01g *23/06, 23/26*
U.S. Cl. 177—186 **13 Claims**

This scale's weight indicating mechanism is protected against destructive shear leads being imposed on the rack

and pinion through the weight indicating means, first by providing a cushioning spring abutment for the rack near the return end of the slot for cushioning effect. Secondly, an elongated rotary floating stop plate is provided for the weight indicating dial, having widely spaced stop projections at the pivoted end for abutment with opposite sides of a boss on the



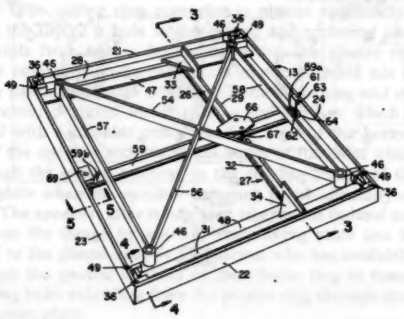
dial adapter for one portion of the greatly increased range of free rotation of the dial in either direction, a stop projection on the stop plate on its other end being arranged to engage either side of a fixed stop to provide plenty of additional free turning, and hence regardless of "flywheel" action of the dial, no damage is done to the vulnerable scale parts mentioned.

3,666,032

FLEXURE BASE SCALE

Doro Maffia, Santa Rosa, and Linus G. Schwartz, Rohnert Park, both of Calif., assignors to National Controls, Inc., Santa Rosa, Calif.

Filed July 13, 1970, Ser. No. 54,473
Int. Cl. G01g *21/08*
U.S. Cl. 177—256 **17 Claims**



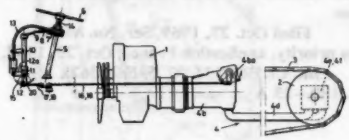
Scale in which force applied to a platform is transmitted to a transfer lever arm through flexure plates. In one embodiment, the transfer arm is connected to a load cell which produces an electrical signal which actuates digital means to provide a digital indication of the weight of an object on the platform. In other embodiments the transfer arm bears against a hydraulic load cell which is connected to a pressure gauge or digital display means for indicating the weight of an object of the platform.

3,666,033

STEERING MECHANISM FOR TRACKED VEHICLES, ESPECIALLY SNOW MOBILES

Walter Haug, Blaustein, Germany, assignor to Karl Kassbohrer Fahrzeugwerke, Ulm (Donau), Germany

Filed June 1, 1970, Ser. No. 42,141
Claims priority, application Germany, June 3, 1969, P 19 28 332.0
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 **4 Claims**



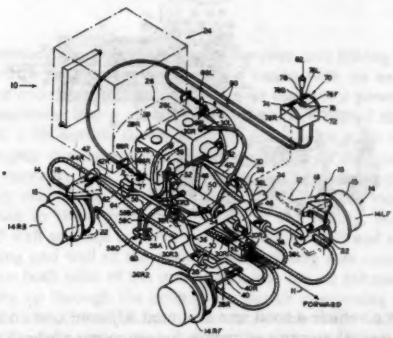
Steering mechanism for a vehicle having independently driven wheels, especially a tracked vehicle. Assuming the wheels or tracks on opposite sides of the vehicle to be independently driven by the speed controllable motors, such as hydraulic motors, one respective end of suitable push-pull rods are connected to the controls of such motors for operation of same in forward, reverse directions and for placement in neutral position. A steering wheel is connected by linkage to a rotatable substantially vertically, positioned shaft and a crank is mounted by its apex pivotally to one end of said shaft, the axis of such pivoting being substantially perpendicular to the axis of rotation of said shaft. When in one selected pivotal position, a first arm of said crank is substantially coaxial with the axis of said shaft and the free end of said arm is connected to said rods. The free end of the other arm of said crank is connected to a manual control by which the crank can be moved on its pivot. Thus rotation of said shaft by the steering wheel when said first arm is coaxial with the shaft effects no movement of said push-pull rods and same remain in neutral position. Movement of said crank on said pivot will move said rods to control the motors to forward, reversing, or neutral positions. Rotation of said shaft when said crank is in a position for forward or reversing operation will alter the respective degree of positioning of the respective motors to effect the desired steering function.

3,666,034

HYDROSTATIC VEHICLE—FOUR-WHEEL DRIVE, FOUR-WHEEL STEERING

Howard E. Stuller, and Jerry D. Baker, both of Lubbock, Tex., assignors to Clark Equipment Company

Filed Oct. 24, 1969, Ser. No. 869,211
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 **14 Claims**



A vehicle having an independent drive motor for each wheel, the wheels being positionable to either a straight fore-

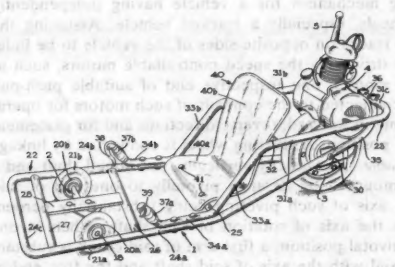
and-aft position or angular position; in a straight position, turning is done by differential in the speed between the outer and the inner wheels; when the wheels are in angular position, the wheels can spin-turn in either direction about an internal vertical axis.

3,666,035

SPORTS VEHICLE STEERED BY INCLINATION OF DRIVER'S BODY

Jean Paul Antoine Dudouyt, Route d'Oix, Labenne (Landes), France

Filed Oct. 27, 1969, Ser. No. 869,459
Claims priority, application France, Oct. 25, 1968, 171531
Int. Cl. B62d *15/00, 61/00;* **B62k** *15/00*
U.S. Cl. 180—25 A **9 Claims**



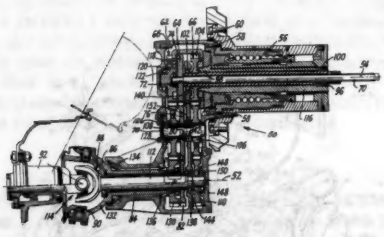
The invention relates to a three-wheeled power-driven vehicle wherein a motor driven frictional driving member is brought into engagement with a ground engaged traction wheel with steering of the vehicle being accomplished by the driver thereof leaning laterally toward one side or the other of the vehicle.

3,666,036

TRAILING ROAD ARM SYSTEM

Joseph Ernest Scerbo, 710 Pinehurst Rd., York, Pa.

Filed May 18, 1970, Ser. No. 38,343
Int. Cl. B60k *17/30;* **B62d** *61/10*
U.S. Cl. 180—43 R **5 Claims**



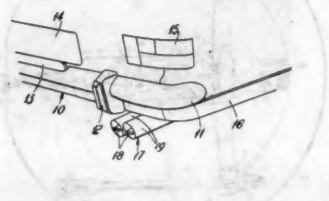
In a vehicle a road arm mounted adjacent one end thereof for pivotal movement, means for mounting a wheel adjacent the other end of said road arm, means for steering said wheel about a generally vertical axis, and means for maintaining said axis in a constant attitude as the road arm is pivoted.

3,666,037

MOTOR VEHICLE EXHAUST PIPES

Herbert Otto, Russelsheim, and Helmut Schonberger, Ginsheim, both of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 24, 1970, Ser. No. 75,047
Claims priority, application Germany, Sept. 27, 1969, P 19 48 939.5
Int. Cl. B60k *13/04*
U.S. Cl. 180—64 A **2 Claims**



A motor vehicle exhaust pipe has an end piece which is formed as a nozzle and directed downwards and is also provided with an upwardly directed bend. The upper vertex of the bend is arranged above the central axis of the exhaust pipe and the lower vertex is arranged in the region of the central axis.

The cross section of the end piece is constricted in nozzle-like fashion up to the termination of the bend and is constant up to the exit aperture.

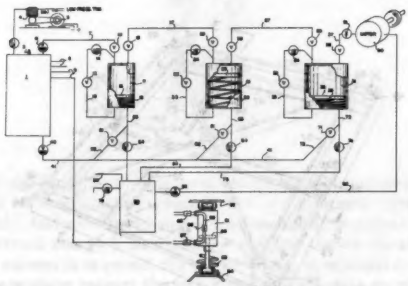
This arrangement provides a rapid lead-away of the waste gases from the vicinity of the vehicle and thereby prevents soiling of the rear windows.

3,666,038

AIR PULSING SYSTEM

Steve A. Hudspeth, and John B. Lunsford, both of Springfield, Oreg., assignors to FMA, Inc., Eugene, Oreg.

Filed Oct. 8, 1970, Ser. No. 79,124
Int. Cl. B60k *3/00, 27/00*
U.S. Cl. 180—66 B **7 Claims**



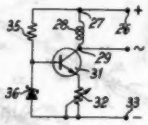
A system utilizing a pressure storage vessel for initially charging a first air cylinder of a series of air cylinders. Valve means admits a flow of pressurized air, in a sequential manner, into the cylinders for piston movement downwardly to compress spring members to a loaded condition. Additional valve means, closed during downward piston movement, are subsequently actuated to permit discharge of an air impulse, by the action of said spring combined with a second source of air pressure acting on the underside of the piston. The last cylinder of the series is operable to impart a force to a media for the operation of a motor for powering a vehicle.

3,666,039

ARRANGEMENT FOR DETECTING SLIDING AND SLIPPAGE OF VEHICLE WHEELS

Karl Bachle, Esslingen-Hegensberg, and Jurgen Knorr, Neckarsulm, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 6, 1970, Ser. No. 52,192
Claims priority, application Germany, July 12, 1969, P 19 35 518.1
Int. Cl. B60t 8/08; B60k 27/06
U.S. Cl. 180—105 E 19 Claims



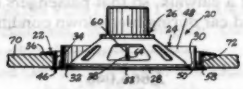
A generator wheel turning with the vehicle wheel forms a magnetic circuit with a core and coil, the air gap between the core and generator wheel varying constantly during rotation of the latter so as to produce an alternating voltage in the coil, which is fed a direct current from a constant current source.

3,666,040

CEILING MOUNTING RING FOR SPEAKER CONES

Heinrich J. Junk, Maplewood, Mo., assignor to Chamois Electronic Manufacturing Company, Inc., Chamois, Mo.

Filed July 6, 1970, Ser. No. 52,592
Int. Cl. G10k 13/00; H04r 1/28
U.S. Cl. 181—31 R 7 Claims



A ceiling ring for mounting speakers in a ceiling. The ceiling ring is especially adapted for mounting a speaker from the bottom side of the ceiling after the ceiling has been constructed. The ceiling ring comprises a plaster ring inserted through the top of a hole in the ceiling and a closing plate which nests from below the ceiling within the plaster ring after the ceiling has been finished. The closing plate has an inwardly extending flange defining a central opening and opposite cutout portions which receive the speaker which is provided with a circular grill extending beyond the bottom edges of the speaker and which has a pair of flat sides which fit through the cutout opening in the rim-like flange of the closing plate when the speaker is turned perpendicularly on its side. The speaker, after it has been inserted, is righted and rests upon the flange by gravity. The closing plate can be clamped to the plaster ring by a workman who has availability through the central opening of the plaster ring to fasten connecting bolts extending from the plaster ring through slots in the closing plate.

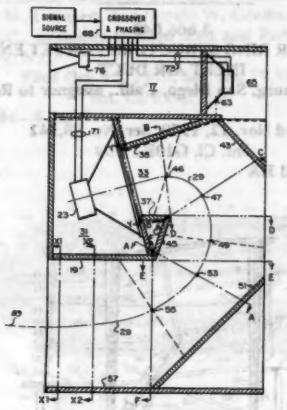
3,666,041

SPEAKER ENCLOSURE

Alan A. Engelhardt, 2656 Newhall St., Apt. #31, Santa Clara, Calif.

Filed July 13, 1970, Ser. No. 54,203
Int. Cl. G10k 13/00; H04r 1/28
U.S. Cl. 181—31 B 4 Claims

An improved speaker enclosure provides a close approximation to a true exponentially expanded horn for a bass-responsive speaker in a relatively small-volume cabinet that is disposed at the corner of a room. The cabinet also includes a separate section for a mid-range responsive speaker which



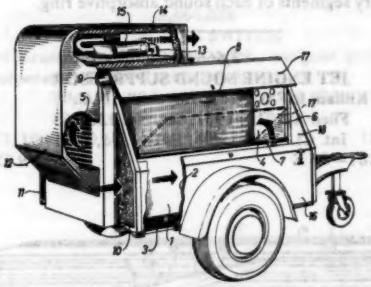
can be properly phased with respect to the acoustic waves at the output of the bass-responsive section.

3,666,042

METHOD FOR ELIMINATING NOISE FROM A MOTOR POWER UNIT AND DEVICE FOR THE PURPOSE

Jerzy Henryk Cederbaum, Sorterargaton 14-16, Vallingby, Sweden

Filed May 7, 1971, Ser. No. 141,281
Claims priority, application Sweden, Feb. 22, 1971, 1295
Int. Cl. F04b 39/12; F01n 1/00
U.S. Cl. 181—33 K 2 Claims



Noise eliminating device for a motor power unit having a chassis with a rectangular frame and a casing with an end wall at one end of the frame, a ceiling over the motor power unit compartment and a cooler grill at the other end of the frame and, a bit outside the sides of the frame, side walls of height roughly corresponding to half the height of the unit and with movable side walls intended to enclose the unit laterally by connection to the upper edge of the fixed side walls as also to the corresponding edge of the ceiling, and finally end wall sections connecting to the cooler grill and to the opposing end wall of the casing and enclosing side compartment on both sides of the unit, which also has an exhaust pipe passing up through the ceiling, the device comprising a plate under the chassis frame, two detachable side walls separating the side compartments from the power unit compartment over a major part of the unit, perforated plates in the end wall sections connected to the cooler grill, allowing the entry of air to the side compartments, an impeller which forces the cooling air out through the cooler grill, a cover

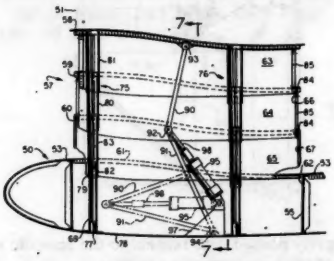
which is L-shaped viewed from the side, providing an outer screen for the cooler grill, and inside the upper part of the cover a silencer for the exhaust pipe.

3,666,043

AIR DIVIDER RING STRUCTURE FOR JET ENGINE INLET AIR DUCT

Rodney Eschenburg, San Diego, Calif., assignor to Rohr Corporation

Filed Nov. 12, 1970, Ser. No. 88,542
Int. Cl. G10k *11/04*
U.S. Cl. 181—33 HA **4 Claims**



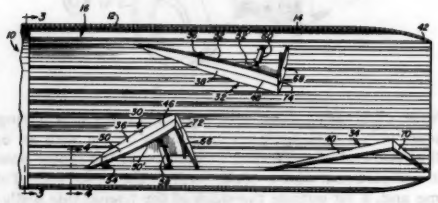
One or more inlet air dividing, sound absorptive rings are supported co-axially within the inlet duct of a jet engine nacelle on a plurality of radially inwardly extending, streamlined struts. In one form of the invention, these struts are telescopically extensible and retractable to move the rings from deployed position concentrically in the air duct to stowed condition within the cowl defining the air duct. In the other forms of the invention each sound absorptive ring comprises a plurality of arcuate acoustical honeycomb panel sections releasably connected at their lateral edges by piano hinge type connectors to narrow longerons supported by said struts, the panel sections and the longerons comprising complementary segments of each sound absorptive ring.

3,666,044

JET ENGINE SOUND SUPPRESSOR

Claud R. Killian, R.F.D. No. 2, Hayesville, N.C.

Filed Apr. 13, 1971, Ser. No. 133,663
Int. Cl. B64d *33/06*; F01n *1/08*, *1/16*
U.S. Cl. 181—33 E **9 Claims**



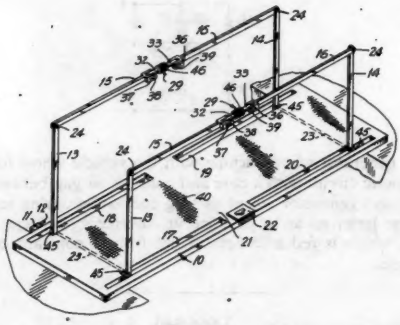
An elongated tubular jet engine nozzle including inner wall surfaces, sound wave trap means extending along and spaced about said inner wall surfaces operative to effectively trap and absorb a majority of sound waves incident thereon along paths inclined 15° or more relative to the center line of the nozzle. The nozzle includes rigid sound wave reflecting surfaces spaced along and about the inner wall surfaces of the nozzle inclined at least 10° relative to the longitudinal center line of the nozzle and the reflecting surfaces are operative to reflect sound waves moving generally axially of the nozzle and incident thereon toward the remote inner wall surfaces and the associated sound wave trap means thereon along paths inclined more than 15° relative to the center line of the nozzle.

3,666,045

EMERGENCY GANGWAY FOR RAILROAD CARS

Martin F. Olsen, 3192 Cambridge Ave., Bronx, N.Y.

Filed Mar. 15, 1971, Ser. No. 124,086
Int. Cl. E01d *15/12*, *19/10*
U.S. Cl. 182—20 **5 Claims**



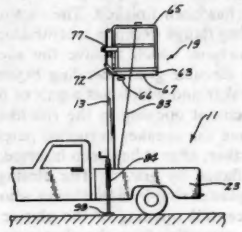
An emergency gangway particularly adaptable for railroad cars, wherein a compartment door within the railroad car includes detachable hinges so that the door can be removed and used as an emergency gangway exit by raising folded railings which are recessed within the door panel. The gangway is erected between adjacent railroad cars, or between a railroad car and a catwalk, so that passengers may easily exit from the railroad car during breakdown conditions.

3,666,046

PORTABLE SCAFFOLD

Clarence A. Meinecke, Jr., 306 South Pinet, Jefferson, Iowa

Filed Jan. 19, 1971, Ser. No. 107,764
Int. Cl. E04g *1/22*
U.S. Cl. 182—145 **8 Claims**



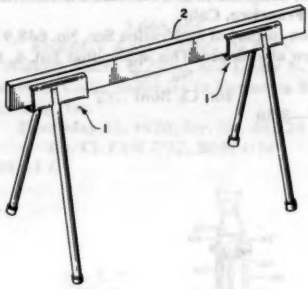
Described herein is a portable, vertically adjustable, scaffold. This scaffold comprises a base, a telescoping mast hingeably attached thereto and a platform. The telescoping mast is raised by a hydraulic hoist and the mast is rotated about its lower end with a hydraulic hoist. As the telescoping mast is raised, a cable secured to the mast raises the platform assembly along the mast. Outriggers are provided to add stability to the scaffold.

3,666,047

SAWHORSE SUPPORT OR BRACE

John E. Adnerson, 2427 Kessler Blvd., Lincoln, Nebr.

Filed Apr. 29, 1971, Ser. No. 138,502
Int. Cl. E04g 1/32; F16m 11/00
U.S. Cl. 182—185 10 Claims



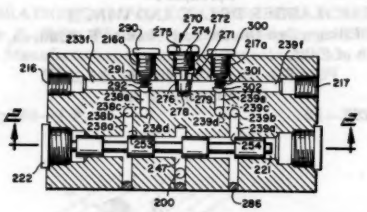
A sawhorse support or brace comprises a unitary metal body with a bottom and upstanding side members inclined inwardly therefrom to form a support for a cross member. Tubular legs are insertable through openings in the bottom member and are engaged at their upper ends by metal tangs or the like. Flexure of the legs under load causes the side member to grasp the cross member more tightly. The legs extend partially through and along slots formed in the side members. Springs releasably embrace the legs and urge them into the slots.

3,666,048

CROSS PORTING STRUCTURE

Ernest J. Zajaczkowski, Maple Heights, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 30, 1970, Ser. No. 85,522
Int. Cl. F16n 25/02
U.S. Cl. 184—7 E 4 Claims



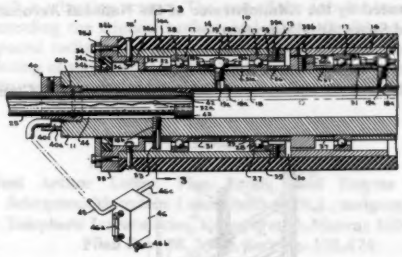
A cross porting structure for lubricant feeders. The structure includes a continuous straight outlet passageway having an outlet opening at opposite ends of said feeder and a pair of supply passageways alternately supplying lubricant to the outlet passageways, each supply passageway including an axial extension thereof acting as an alternate outlet opening and having a spring biased check valve located therein. Interposed between the intersection of the two supply passageways and the outlet passageway is a plug type valve which in one position serves to connect a supply passageway with one set of outlet openings and in a second position serves to connect each of the supply passageways with both sets of outlet openings.

3,666,049

EXPANDER ROLL ASSEMBLY WITH OIL-MIST LUBRICATION

Thomas W. Kern; George L. Barringer; William Ross Wands; Charles W. Leonard, and Gerald W. Goodman, all of Salisbury, N.C., assignors to Kern Roll and Rubber Company, Salisbury, N.C.

Filed Oct. 12, 1970, Ser. No. 79,914
Int. Cl. F16n 7/26
U.S. Cl. 184—6.26 11 Claims



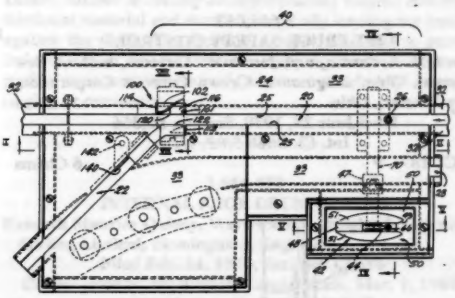
An expander roll assembly, wherein the shaft has a lubricating conduit extending along substantially its axial length, an oil-mist lubricant supply is coupled to an end of the lubricating conduit, and spray nozzle fittings are provided laterally adjacent each ball bearing unit between the outer surface portion of the roll and the shaft to spray oil-mist lubricant against a portion of each ball bearing assembly. An end seal assembly is provided to protect against entry of dust and similar foreign matter at the ends of the roll, and structure is provided for withdrawal of any surplus oil-mist lubricant to an external collecting facility.

3,666,050

TOW LINE SWITCH

Robert Krammer, Framington, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Mar. 16, 1970, Ser. No. 19,993
Int. Cl. B61l 13/02; E01b 7/14
U.S. Cl. 104—130 18 Claims



A switch for an in-floor towing system, the switch utilizing a sensor and a responder or switchplate, and a mechanical linkage interconnecting the sensor with the responder. The linkage includes a motion translating mechanism whereby rotational motion in one plane is converted into rotational

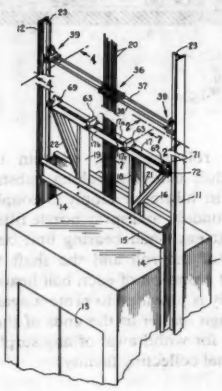
motion in a plane at right angles thereto. The responder is mounted for rotation in the latter plane, and has a slot with walls such that in one position it provides a wall inclined crosswise to the main track and in another position provides a straight wall in one side of the main track closing off the spur track.

3,666,051

CABLE STABILIZER FOR OPEN SHAFT CABLE OPERATED ELEVATORS

Edwin J. Davis, Merritt Island, and Bill A. Tolson, Titusville, both of Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 6, 1970, Ser. No. 61,535
Int. Cl. B66b *9/00*
U.S. Cl. 187—1 **1 Claim**



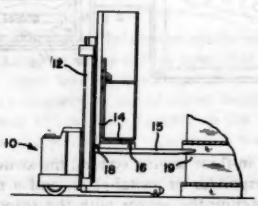
An apparatus for stabilizing the cables used to raise and lower an elevator compartment. A guide member through which the cables of the elevator pass is provided for aiding in preventing the cables from swaying in the wind. A pair of stops are carried on the guide rails so as to prevent the guide member from dropping below an intermediate location. When the elevator compartment is raised above the intermediate location such, in turn, causes the guide member to be raised therewith.

3,666,052

LIFT TRUCK SAFETY CONTROL

Richard N. Anderson, and James W. Uetrecht, both of New Bremen, Ohio, assignors to Crown Controls Corporation, New Bremen, Ohio

Filed June 29, 1970, Ser. No. 50,866
Int. Cl. B66b *5/02, 9/20*
U.S. Cl. 187—9 **6 Claims**



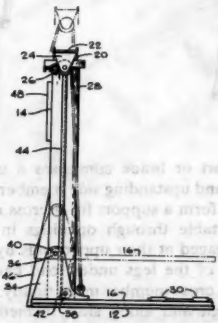
An industrial lift truck with a power operated lift carriage has pivoted forks in a normal horizontal position to carry a load. Switches or valves in the carriage power control sense the position of the forks and prevent carriage movement when the forks are tilted from the normal position.

3,666,053

VEHICLE LIFT

Robert M. Tormey, Dayton, Ohio, and John G. Petry, San Jose, Calif., assignors to J. D. Cochin Manufacturing Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 648,911, June 26, 1967, now abandoned. This application Jan. 6, 1970, Ser. No. 993
Int. Cl. B66f *7/02*
U.S. Cl. 187—8.50 **3 Claims**



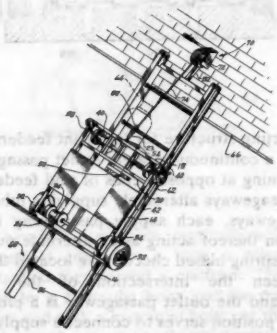
A vehicle lift employing a fluid actuated, vertically mounted power device having a shiftable portion connected by a mount to a vehicle lift plate which extends laterally from the power device. The mount has roller means for engaging the outer surface of the power device to equalize the load of a vehicle on the lift plate. The lift plate has support arms for engaging the underside of a vehicle after the latter has been moved onto the lift plate and before the lift plate is elevated by actuation of said power device.

3,666,054

LADDER DOLLY AND WINCH

Frank L. Ellings, San Dimas, and Thomas E. Milliron, Valinda, both of Calif.

Filed Feb. 24, 1970, Ser. No. 13,293
Int. Cl. B66b *9/20*
U.S. Cl. 187—10 **7 Claims**



A hand truck mounted on wheels has a load carrying

framework and an extendable handle for steering the hand truck to the base of a ladder. The rear side of the hand truck framework has flanged rubber rollers arranged for engagement with the rails of the ladder. A winch mounted at the top of the ladder drives a steel cable which is releasably coupled to the hand truck framework. During operation of the winch, the rollers provide guided upward movement for the hand truck and the load along the rails of the ladder.

3,666,055

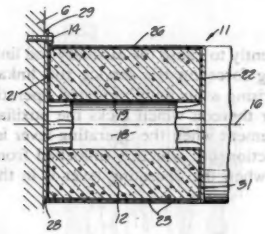
ENERGY ABSORBING DEVICE

Grant W. Walker; Duane B. Ford, and Lester N. Meinzer, all of Sacramento, Calif., assignors to Dynamics Research and Manufacturing, Inc.

Filed May 25, 1970, Ser. No. 40,220

Int. Cl. F16f 7/12; B60t 1/14

U.S. Cl. 188—1 C **11 Claims**



An energy absorbing device includes a block adapted to be mounted on a support in position to receive an impact. The block is preferably a figure of revolution about an axis disposed approximately in the direction of impact. The block is conveniently made out of vermiculite with a cement binder and usually has a hole along the axis. A wire is wrapped coaxially around the block and has turns spaced slightly apart. An impact plate extends normally across one end of the block. The block is enclosed in a deformable wrapper.

3,666,056

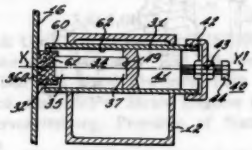
VIBRATION DAMPER FOR VIBRATING SCREENS

Mathew P. Hahn, Wauwatosa, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 28, 1970, Ser. No. 67,830

Int. Cl. F16f 7/08

U.S. Cl. 188—1 B **11 Claims**



A vibration damper for a vibrating screen is provided with tubular housing and a flexible cylinder arranged within the tubular housing, with the flexible cylinder projecting outwardly of one end of the housing. The flexible cylinder provides a friction surface perpendicular to a central axis through the cylinder. The end of the cylinder opposite the friction surface, is spaced inwardly from the adjacent end of the housing. A ram assembly is connected to the second end of the housing. The ram assembly includes a rigid member arranged within the housing to engage the adjacent end of the flexible cylinder and cap mounted over the second end opening of the housing. The cap is provided with a central axial bore, at least partly threaded, into which is fitted a threaded actuating bolt which extends therethrough and engages the rigid member. The bolt is operative upon turning to move the rigid member toward the flexible cylinder and apply an adjustable force biasing the flexible cylinder to move the friction surface outwardly of the first end opening of the tubular housing for vibration dampening engagement with a vibrating screen. The end of the tubular housing surrounding the friction surface end of the flexible cylinder is spaced radially outward of the flexible cylinder and limits flexing of the flexible cylinder transversely to the central axis through the tubular housing.

3,666,057

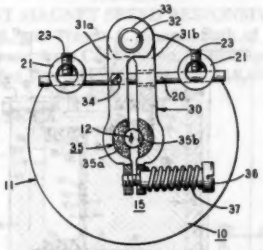
FLOATING DAMPER ASSEMBLY

Noel Arthur Leifer, Pine Brook, and Eugene Charles Schramm, Mountain Lakes, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1970, Ser. No. 101,476

Int. Cl. F16f 7/06

U.S. Cl. 188—1 B **5 Claims**



A floating damper assembly for applying a constant damping torque to a motor shaft exhibiting substantial runout comprises a flexible cable element, which is anchored at its ends to the motor housing, and a floating damper, which is attached to the cable element substantially at the element's center, further including an appropriately shaped bushing of frictional material and means for radially loading the bushing against the shaft. The floating damper assembly is particularly useful in an incremental stepping motor whose step profile must remain relatively constant and free of excessive ringing or overshoot.

3,666,058

INTERNAL SHOE DRUM BRAKES

Kenneth Maurice Quiney, Warwickshire, England, assignor to Girling Limited, Birmingham, England

Filed Feb. 24, 1970, Ser. No. 13,596

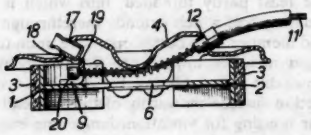
Claims priority, application Great Britain, Mar. 1, 1969, 11,032/69; Oct. 18, 1969, 51,267/69

Int. Cl. F16d 65/22, 65/42

U.S. Cl. 188—106 A **19 Claims**

In a shoe drum brake a mechanical actuator for separating adjacent shoe ends includes a lever pivotally connected to a shoe and adapted to act on the other shoe through a strut which is chordal with respect to the axis of the brake. In the off position of brake the lever is held in a first retracted position spaced from a fully retracted position by a back stop.

The back stop is adapted to be manipulated externally of the brake to permit the lever to move into the fully retracted position under the influence of pull-off springs whereby the braking clearances are increased.

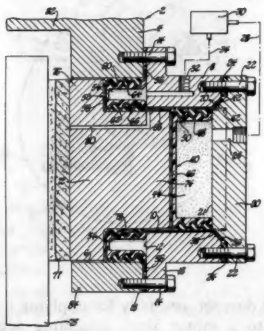


3,666,059

FAIL-SAFE HYDRUALIC BRAKE APPARATUS

Tom H. Thompson, 2800 North Atlantic Drive, Towers Apt. 910, Daytona Beach, Fla.

Filed Oct. 22, 1970, Ser. No. 83,083
Int. Cl. F16d *65/20*
U.S. Cl. 188—106 R **19 Claims**



Hydraulic brake apparatus comprising a housing having a pair of flexible resilient actuators mounted therein each forming a separate closed chamber with the housing. Each of the closed chambers is independently connected with a source of brake fluid. When the brakes are applied to increase the pressure from the source to the actuators, the actuators both expand to apply braking pressure. Since the actuators are independently connected with the source of brake fluid, the failure of one actuator does not result in failure of the system.

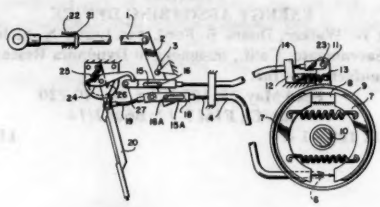
3,666,060

SERVICE AND PARKING BRAKE ARRANGEMENT FOR TRAILER VEHICLES

Hans O. Schroter, 8 Munchen 22, Robert-Koch-Strasse 18, Munchen, Germany

Filed Nov. 25, 1970, Ser. No. 92,652
Claims priority, application Germany, Nov. 27, 1969, P 19 59 633.9
Int. Cl. B60t *7/20*
U.S. Cl. 188—112 **6 Claims**

A wheel brake mechanism on a trailer has a brake shoe support mounted for limited tangential movement with respect to the wheel axle but restrained against movement during forward movement of the trailer vehicle by an abutment mounted on the frame of the vehicle. An auxiliary rod linkage interconnects the brake shoe support to the service rod linkage which is operated during ordinary or service braking applications to apply an actuating force to the brake shoes of the trailer wheel brake mechanism. During rearward movement of the trailer vehicle the brake shoe support may move sufficiently to cause the auxiliary rod linkage to exert a counteracting force on the service rod linkage. A parking brake comprising a pivotally mounted operating lever has a locking lever thereon which locks the auxiliary rod linkage against movement when the operating lever is moved in the braking direction but which is unlocked from the auxiliary rod linkage when the operating lever is in the release position.

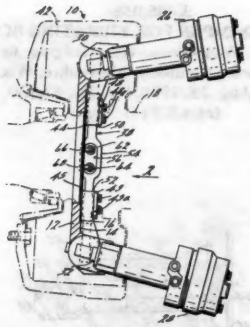


3,666,061

VEHICLE BRAKE ASSEMBLY

Charles W. Nehr, Bloomfield, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed July 13, 1970, Ser. No. 54,173
Int. Cl. F16d *65/08*
U.S. Cl. 188—206 R **9 Claims**



A brake assembly adapted to be mounted on a motor vehicle axle member and constructed to permit removal of the assembly brake shoes for relining without removal of the brake drum or other structure located outboard of the assembly. The assembly includes a spider abutting the outboard surface of and secured to a radial flange formed on the axle. The spider carries brake shoes located inboard of the spider-axle flange interface that are held in place by brake shoe return springs attached to the shoes and the inboard face of

the spider at a point easily accessible from inboard of the assembly. Lateral brake shoe movement along the axle axis is prevented by brake shoe retaining members normally located outboard and inboard of the brake shoes. The inboard of these retaining members are removable to permit the brake shoes to be removed from the assembly by inboard movement thereof.

3,666,062

MULTIPLE-DISC FRICTION CLUTCH

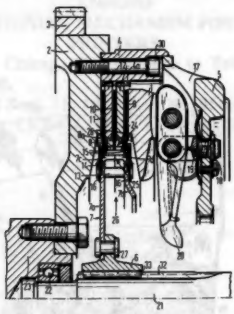
Hans Walter Riese, Dittelbrunn, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed Oct. 27, 1970, Ser. No. 84,396

Claims priority, application Germany, Nov. 27, 1969, P 19 59 520.1

Int. Cl. F16d *13/56*

U.S. Cl. 192—70.28 **5 Claims**



The two terminal driven discs of a stack of driven and driving discs which directly engage the flywheel and the pressure plate in an otherwise largely conventional, multiple-disc, automotive friction clutch are held in forks distributed over the circumference of a hub assembly and each consisting of a rigid abutment and a leaf spring axially biasing the disc away from the other terminal disc and toward the abutment. This arrangement holds the terminal discs in well-defined axial positions in all clutch conditions and reduces the axial movement of the hub assembly during clutch engagement and disengagement, particularly when the springs exert greater biasing force on the terminal driven disc near the flywheel.

3,666,063

POWER UNITS AND PARTS THEREOF

Musgrave Schoeman, Pinetown, and Herbert Halliday Warmington, Durban, Natal Province, both of Republic of South Africa, assignors to Straw Engines (Proprietary) Limited, Pietermaritzburg, Province of Natal, Republic of South Africa

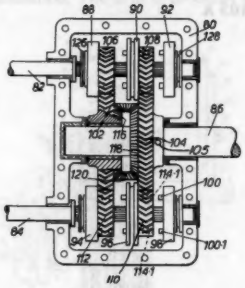
Filed Sept. 4, 1970, Ser. No. 69,598

Claims priority, application South Africa, Sept. 12, 1969, 69/6487

Int. Cl. F16d *21/04*; F16h *27/02*; F02b *53/00*

U.S. Cl. 192—21 **1 Claim**

The invention concerns a torque converter in which multidirectional input is converted to unidirectional output. The invention also concerns a rotary engine giving multidirectional output in combination with the converter to give unidirectional output therefrom. The converter includes two unidirectional clutches, one reversed with respect to the other, and a reversing means for enabling input in both



clockwise and anticlockwise directions to be converted to unidirectional output.

3,666,064

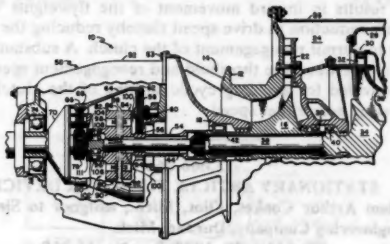
PERMANENT MAGNET SPEED RESPONSIVE CLUTCH

Waldo R. Bird, and Wayne C. Shank, both of Williamsport, Pa., assignors to Avco Corporation, Williamsport, Pa.

Filed Feb. 25, 1971, Ser. No. 118,685

Int. Cl. F16d *27/01*

U.S. Cl. 192—84 PM **10 Claims**



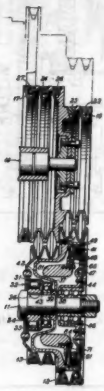
The disclosure illustrates a high speed clutch assembly incorporated in a differential gas turbine engine to prevent the turbine shaft from rotating at a speed greater than the compressor shaft speed. The clutch assembly comprises a pair of opposed clutch elements on the turbine shaft and compressor shaft, displaceable into engagement with one another. The clutch elements have magnets oriented so that as the rotational speed of the shafts become equal they are magnetically attracted into engagement. A magnetic spring biases the clutch elements away from one another so that they engage when the shaft speeds are substantially equal. In one form the magnetic spring comprises a pair of coaxial sleeve-type magnets positioned on the turbine shaft and compressor shaft to bias the clutch elements apart. In another form it comprises a bar magnet in the turbine shaft and a pair of bar magnets oriented with their longitudinal axis parallel to the axis of the shafts.

3,666,065

SPEED RESPONSIVE TRANSMISSION

Charles T. Schmidt, North Riverside, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed July 17, 1970, Ser. No. 55,772
Int. Cl. F16d *43/06*
U.S. Cl. 192—103 A 4 Claims



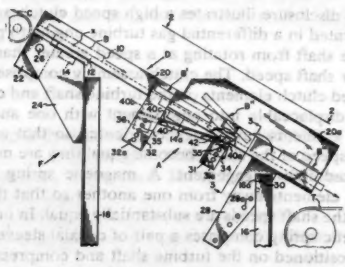
A speed responsive clutch is provided with shifting means including orbitally rotatable centrifugal flyweights and a lost motion connector. At a predetermined drive speed, the radius of rotation of the flyweights changes by means of the lost motion connector providing a change in energy level without corresponding change in drive speed. Rotation of an input member at a predetermined threshold speed of rotation results in outward movement of the flyweights without further increase in drive speed thereby increasing the energy level to provide a clutch release force. Rotation of the input member at another preselected reengagement speed of rotation results in inward movement of the flyweights without further reduction in drive speed thereby reducing the energy level to permit reengagement of the clutch. A substantial difference between the threshold and reengagement speeds can be provided for avoiding cyclic shifting of the clutch when operating near either speed.

3,666,066

STATIONARY ARTICLE TURNOVER DEVICE

William Arthur Coakes, Flint, Mich., assignor to Simplicity Engineering Company, Durand, Mich.

Filed May 28, 1970, Ser. No. 41,210
Int. Cl. B65g *11/20*
U.S. Cl. 193—43 B 8 Claims



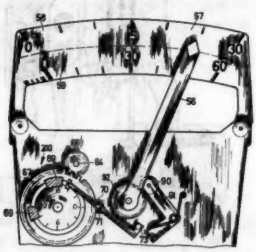
A device for overturning articles, such as brake drum castings, and the like, which travel down a vertically inclined chute, including stationarily mounted apparatus for temporarily interrupting the travel of a portion of the article while permitting the remainder of the article to swing forwardly therearound so that the momentum of the workpiece forces the article into an inverted position as it moves forwardly down the inclined chute.

3,666,067

PARKING METER HAVING AN INCREASED RATE DURING PEAK DEMAND PERIODS

Bernhard Kaiser, Villingen, Germany, assignor to Kienzle Apparate GmbH, Villingen, Germany

Filed Jan. 20, 1971, Ser. No. 108,102
Claims priority, application Germany, Jan. 21, 1970, P 20 02 468.4
Int. Cl. G07f *17/24*
U.S. Cl. 194—DIG. 22 11 Claims



In order to operate at an increased rate during peak demand hours, a parking meter has rotary cam means with lugs representing peak demand hours and controlling a cam follower to shift a transmission so that a pointer moves faster during peak demand hours than during normal demand hours from a set position representing a period of time to a position of rest representing the end of a parking period. In a second embodiment, the cam follower sets the pointer to represent during normal demand hours a longer parking period than during peak demand hours. In a third embodiment, different coins set the pointer to the same position so that a more valuable coin is required during peak demand hours for the same parking period.

3,666,068

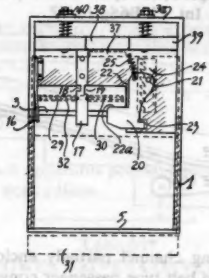
COIN RELEASED MECHANISM IN A VENDING MACHINE

Patrick Joseph Kenny, Bray, Ireland, assignor to Kenson Limited, Bray, Ireland

Filed June 1, 1970, Ser. No. 41,894
Claims priority, application Ireland, June 4, 1969, 761/69
Int. Cl. G07f *11/20*
U.S. Cl. 194—58 20 Claims

A coin released mechanism for mounting in a vending machine cassette comprises a drawer for delivery of an arti-

cle to a customer. The drawer is operated by the customer by inserting a coin or coins in a transverse slot of the drawer.



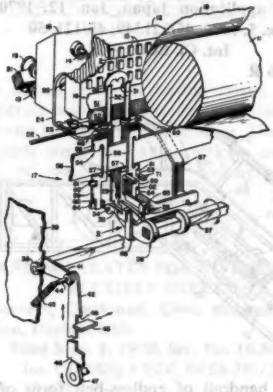
Fixed and movable coin supports are operatively associated with the drawer to support the coin(s) in the slot.

3,666,069

RIBBON POSITIONING MECHANISM FOR TELEGRAPH PRINTERS

Klyoshi Suzuki, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Sept. 15, 1969, Ser. No. 858,081
Int. Cl. B41j *23/02, 33/14, 33/56*
U.S. Cl. 197—16 **13 Claims**



An independently mounted ribbon shift mechanism facilitates two color printing in a telegraph page printer. The mechanism includes a slidably mounted ribbon lifter for reciprocally supporting an inked ribbon to be raised to one of two selected positions to interpose the raised ribbon between a printing element and a platen traversed by the printing element. The printing element is connected through a drive bracket to the ribbon lifter to impart the traversing movement of the printing element to the ribbon lifter.

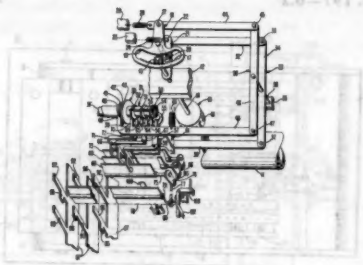
3,666,070

DIFFERENTIAL MECHANISM FOR POSITIONING A TYPE CHARACTER ON A TYPE ELEMENT

John O. Schaefer, Lexington, Ky., assignor to International Business Machine Corporation, Armonk, N.Y.

Filed June 29, 1970, Ser. No. 50,480
Int. Cl. B41j *23/04*
U.S. Cl. 197—18 **18 Claims**

A type element, which is mounted for movement along a writing line and has a plurality of types arranged thereon, is rotated through a differential mechanism to position a selected type at the printing position. The differential mechanism includes a first gear connected to the type element through a rotatably supported shaft. A sector gear meshes with the first gear to rotate the first gear in one direction in accordance with inputs to an arm on which the sector gear is mounted. The arm is pivotally connected by a



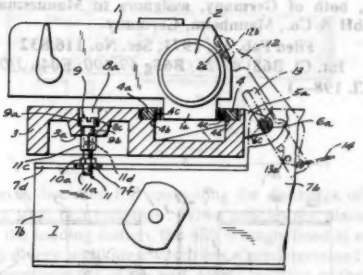
pin to a link, which is pivotally mounted about the axis of the first gear, so that movements of the link change the position of the pin, which is the axis of rotation of the sector gear and is intermediate the sector gear and the input end of the arm, to rotate the first gear in the opposite direction. The inputs to the link and the arm are supplied through separate lever arrangements, which may be actuated by a single driving means or by separate pneumatically controlled means.

3,666,071

ADJUSTABLE PAPER CARRIAGE ASSEMBLY

Horst Purr, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Sept. 4, 1969, Ser. No. 855,133
Claims priority, application Germany, Sept. 5, 1968, P 17 86 245.2
Int. Cl. B41j *19/00*
U.S. Cl. 197—60 **11 Claims**



A paper carriage support is mounted on the supporting frame of a typewriter for angular movement about an axis parallel to the direction of movement of the carriage and to the axis of the platen. An adjusting device, including adjusting screws and stop screws, exactly determines the desired angular position of the carriage support in relation to the supporting frame, so that the impact area of the platen can be moved in the direction of the path of movement of the types of type levers whereby the rebound distance of the types is adjusted.

3,666,072

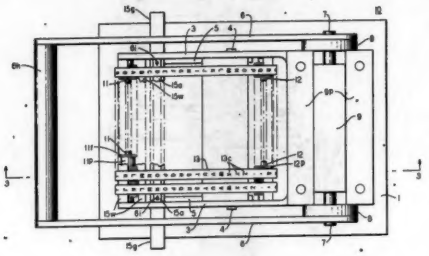
ENDLESS BAND EMBOSSING DEVICE

Charles C. Austin, Nashua, N.H., assignor to Dennison Manufacturing Company, Farmingham, Mass.

Continuation-in-part of application Ser. No. 713,783, Mar. 18, 1968, now abandoned. This application May 6, 1970, Ser. No. 35,209

Int. Cl. B41j *1/20*

U.S. Cl. 197—6.2 9 Claims



An embossing device employing a plurality of sets of interlocking embossing bands; there being one set of bands for each of a group of characters that are to be embossed simultaneously on a suitable medium such as a flexible strip or sheet of plastic material.

Each set of embossing bands has two constituent belts with respective raised and recessed complementary characters, which are juxtaposed. The two constituents belts are interlocked over a portion of their length at a plurality of character positions. Consequently, the correct registration of the belts is maintained during the selection of specified characters. This results in distinct and non-disfigured embossments of the flexible material.

In one embodiment, the constituent bands are closed loops which are nested, one inside the other, and traverse the same orbit. In another embodiment, the constituent bands are closed loops which traverse different orbits.

3,666,073

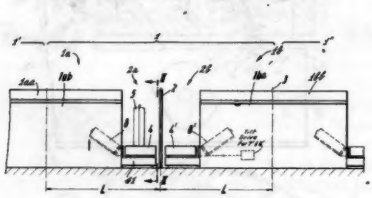
AIRPORT CHECK-IN COUNTER WITH BAGGAGE RECEIVING AND HANDLING FACILITY

Gerhard Lings, Lelmen, and Eberhard Hellermann, Morfelden, both of Germany, assignors to Mannesmann-Geisel GmbH & Co., Mannheim, Germany

Filed Feb. 19, 1971, Ser. No. 116,832

Int. Cl. B65j *47/26*; B65g *69/100*; E04h *3/04*

U.S. Cl. 198—1 8 Claims



An airport check-in counter with desk and baggage receiving and placement area containing a first conveyor belt with scale; a second belt also constructed as scale is behind the first one and feeds baggage tilting and pallet loading facilities. The baggage tilting equipment has two parallely running belts tiltable on an axis between them. The pallet loading facility has two belts on carriages, moving transverse to each other.

3,666,074

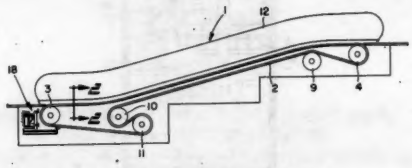
SAFETY BRAKE FOR PASSENGER CONVEYOR

Ernest D. Johnson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 3, 1970, Ser. No. 25,398

Int. Cl. B65g *15/42*

U.S. Cl. 198—16 R 3 Claims



A belt-constraining channel partially encloses the lower pulley of an inclined belt-type passenger conveyor and has a supporting surface for holding a released portion of the belt and a retaining surface for containing the belt between the channel and the lower pulley. Pivotal support of the channel provides braking engagement of an upper edge of the channel with the belt when the supporting member is depressed by the weight of the released portion of the belt.

3,666,075

MOVING-HANDRAIL DEVICE IN MOVING STAIRWAYS AND THE LIKE

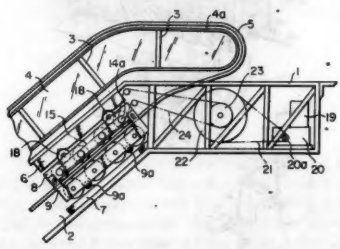
Tetjo Iwata, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, a/k/a Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 5, 1971, Ser. No. 104,109

Claims priority, application Japan, Jan. 12, 1970, 45/3816; Dec. 5, 1970, 45/121349; 45/121350

Int. Cl. B66b *9/12*

U.S. Cl. 198—16 R 8 Claims



The moving handrail of endless-belt form of a moving stairway is driven at a part of its return span by a drive mechanism comprising, essentially, two floating carriages, friction-drive wheels rotatably mounted in a row on one of the carriages, idler wheels rotatably mounted in a row on the other carriage in positions confronting respective friction-drive wheels with the moving handrail interposed and clamped therebetween, and a cam mechanism reacting to increasing driving force on the handrail to cause the friction-drive wheels and idler wheels to grip the handrail with increasing force.

3,666,076

TRANSPORTING SYSTEM

Robert C. Miller, Frederic, Wis., and Glenn R. Nevins, Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

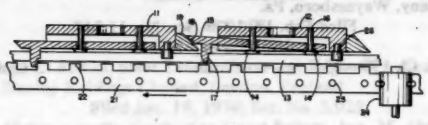
Filed Dec. 18, 1970, Ser. No. 99,468

Int. Cl. B23q *5/22*

U.S. Cl. 198—1 1 Claim

Transporting apparatus in which work pallets are trans-

ported by means of variable engagement with a continuous



metal band which apparatus provides sequential starting and stopping of the work pallets.

3,666,077

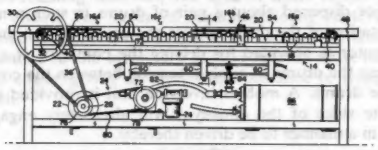
POWER DRIVEN CONVEYOR

Burton H. Marshall, Accord, N.Y.

Continuation-in-part of application Ser. No. 727,745, May 8, 1968, Pat. No. 3,431,805, which is a continuation of application Ser. No. 655,822, July 25, 1967, now abandoned. This application Feb. 18, 1969, Ser. No. 800,051

Int. Cl. B65g *47/22, 13/02*

U.S. Cl. 198—29 **12 Claims**



A power driven conveyor having driven skewed rollers which cooperate with a longitudinally extending guide to position articles laterally of the conveyor. The conveyor may have retractible stops for halting articles on the conveyor and/or one or more guides for turning articles moving therealong.

3,666,078

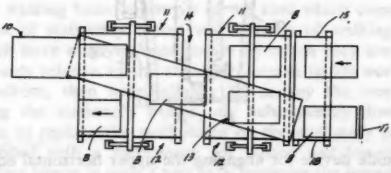
METHOD AND APPARATUS FOR INVERTING RIGID OR FLEXIBLE SHEETS

Elwin J. Biorseth, Cincinnati, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 5, 1970, Ser. No. 16,865

Int. Cl. B65g *47/24;* **B65h** *29/12*

U.S. Cl. 198—33 AD **8 Claims**



The direction of movement of blanks of rigid or flexible sheet material is reversed and the blanks are inverted by subjecting them to centrifugal force sufficient to overcome gravitational effects and maintain driving engagement between endless flexible belts and the blanks while they are driven by the belts along an arcuate path.

3,666,079

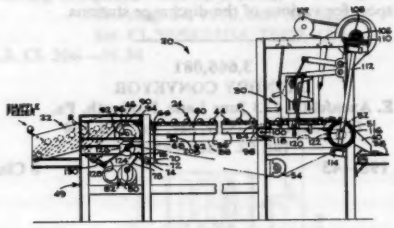
FRUIT ORIENTER

Gerald R. Anderson, Campbell, and William C. Wann, Jr., San Jose, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Aug. 21, 1970, Ser. No. 65,834

Int. Cl. B65g *47/24*

U.S. Cl. 198—33 AA **9 Claims**



A multiple lane fruit orienter having a conveyor comprising transverse carriers with fruit receiving cups. A rotary finder wheel projects into each cup from below to rotate the fruit and locate the stem cavity. In addition to being rotated the finder wheels are oscillated about a vertical axis to rotate the fruit in varying planes. After the stem cavity has been found the finder wheel is no longer rotated but rapidly oscillated with an increasing frequency and decreasing amplitude so that the major axis of the stem cavity and suture plane of the fruit become aligned with the finder wheel. An additional vibration is imparted to the cam that produces the finder wheel oscillation during the suture plane alignment.

3,666,080

CONVEYOR BELT SYSTEM

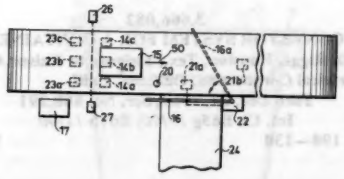
Stig Allan Junior Alfredsson, Sandviken, Sweden, assignor to Sandviken Jernverks Aktiebolag, Sandviken, Sweden

Filed Nov. 14, 1969, Ser. No. 876,967

Claims priority, application Sweden, Apr. 28, 1969, 5979/69

Int. Cl. B65g *43/00*

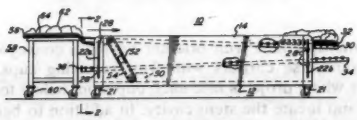
U.S. Cl. 198—38 **7 Claims**



A system is disclosed for controlling the discharge of articles from a steel belt conveyor. When articles are placed on the belt at the loading station, the belt is magnetized at a high intensity in a very small area which has a predetermined relationship, longitudinally of the belt, to the position of the article on the belt. The magnetized spot is also positioned transversely of the belt in accordance with the station where the article is to be discharged. At each discharge station there is an arrangement in the form of a plow and means to move the plow to and from the path of articles carried on the belt so as to deflect the articles from the belt. The plow operating mechanism has an electronic control which includes a Hall-effect transducer positioned adjacent the bottom surface of the belt and relatively positioned transversely of the belt along the path of the magnetized spots for that station. Hence, when an article is placed on the belt and the magnetized spot is produced corresponding to a particular unloading station. The article will be carried to that station and

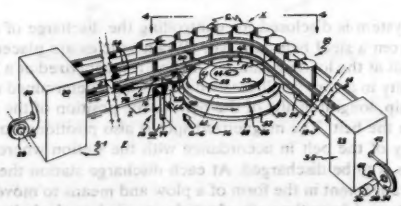
unloaded. The high intensity magnetization is produced by an electromagnet extending transversely from the bottom surface of the belt, and direct current is supplied to the electromagnet coil from a condenser circuit. The current can be caused to flow in either direction through the coil so as to produce a magnetized zone or spot of either north or south polarity. The magnetized zone or spot is surrounded by a ring of the opposite polarity but of insufficient intensity to energize the Hall-effect control unit. The number of discharge stations may be increased by producing two or more magnetized spots for various of the discharge stations.

3,666,081
LAUNDRY CONVEYOR
Stanley E. Axenfeld, 1413 June Lane, Narberth, Pa.
Filed Sept. 16, 1969, Ser. No. 858,324
Int. Cl. B65g *47/00*
U.S. Cl. 198—43 **8 Claims**



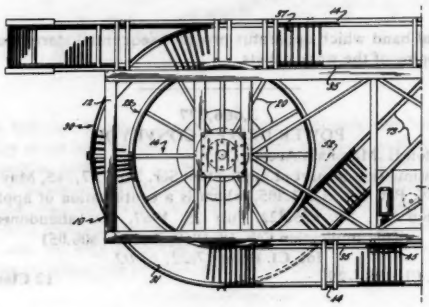
A conveyor for transferring pallets containing pieces of laundry from one location to another. The conveyor includes a frame which supports two sets of vertically spaced guide rails which extend between the ends of the frame. The upper set of guide rails extends downwardly from one end of the frame to the other end, and the lower set of guide rails extends downwardly from the other end of the frame to the one end. A set of driven conveyor belts is provided at the higher end of the upper set of guide rails. A pallet loaded with pieces of laundry is carried by the conveyor belts to the high end of the upper set of guide rails and then slides down the upper set of guide rails. The pallet is unloaded and the empty pallet is placed on the higher end of the lower set of guide rails. The pallet slides down the lower set of guide rails back to the one end of the conveyor where it can be reloaded with the pieces of laundry.

3,666,082
CONVEYOR SYSTEM FOR A CONTAINER
Milton D. Riggs, Houston, Tex., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Dec. 29, 1969, Ser. No. 888,291
Int. Cl. B65g *15/00*; B61b *11/00*
U.S. Cl. 198—130 **11 Claims**



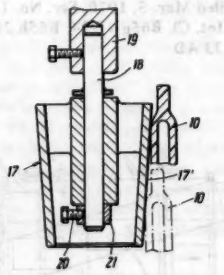
Improved conveyor system for transferring containers and in particular lightweight aluminum cans between stations in a container production plant and the like wherein novel means are provided for holding the container in firm engagement with a conveyor belt element at all times, including periods when the container's direction of travel is sharply or gradually changed during its passage between stations.

3,666,083
CARRIER AND DRIVE MEANS FOR TWO-AXES TYPE REFRIGERATING CONVEYOR
Malcolm C. Smith, Hagerstown, Md., assignor to Frick Company, Waynesboro, Pa.
Filed Feb. 13, 1970, Ser. No. 11,247
Int. Cl. B65g *17/06*
U.S. Cl. 198—136 **3 Claims**



Apparatus for freezing materials and including an endless conveyor disposed about a pair of drums in such a manner that rotation of the drums drives the conveyor. An independent motor is provided for driving the conveyor at a faster rate than the drums to apply a tension between the conveyor and the drums. A mobius inversion unit is provided so that opposite sides of the conveyor will alternately engage the drums in a manner to be driven thereby.

3,666,084
GUIDE DEVICE FOR THE UPPER EDGES OF VERTICALLY POSITIONED AND HORIZONTALLY MOVED PLATES
Otto Stehl, Furth, Germany, assignor to Flachglas Aktiengesellschaft Delog-Detag, Furth/Bavaria, Germany
Filed Feb. 16, 1970, Ser. No. 11,419
Claims priority, application Germany, Feb. 19, 1969, P 19 08 109.5
Int. Cl. B65g *15/00*
U.S. Cl. 198—160 **4 Claims**



A guide device for engaging the upper horizontal edge of vertically disposed glass plates when the same are conveyed in an upright position through an annealing oven. The guide device comprises a relatively wide roller rotatable about a substantially vertical axis, either cylindrically or conically formed or provided with a spherically curved circumference and arranged in such a position that only a narrow, almost a line-like area of their circumference comes into engagement with the marginal edge portion of the plane surface of the glass plate. The guide device may also consist of one or more

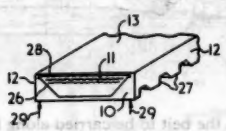
resiliently or pivotally mounted stationary strips covered with a friction-reducing coating along which the glass plates slide during their movement through the annealing oven.

3,666,085

MECHANICAL BELTING

Hugh L. Folkes, Saint Leonard's-on-sea, England, assignor to Dunlop Holdings Limited, London, England

Filed Jan. 19, 1970, Ser. No. 3,925
Claims priority, application Great Britain, Jan. 25, 1969, 4,334/69
Int. Cl. B65g *15/30*
U.S. Cl. 198—193 **10 Claims**



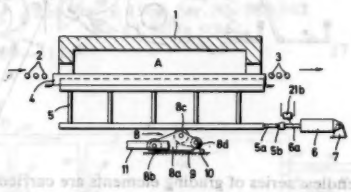
Mechanical belting having transverse rigidity provided by spaced apart transversely extending layers, one of these layers is of compression-resisting material and the other of tension-resisting material, the spaced apart layers giving a beam effect. The layer of tension-resisting material is of troughed shape in a transverse cross section. By this means, the centers of the layers are spaced further apart than their lateral edges, giving an increased resistance to troughing of the belt.

3,666,086

WALKING BEAM CONVEYOR

Heinz Brockmann, Dusseldorf-Gallberg, Germany, assignor to Brockmann & Bundt Industrie-Ofenbau, Dusseldorf, Germany

Filed July 2, 1970, Ser. No. 51,813
Claims priority, application Germany, Jan. 12, 1970, P 20 01 052.0
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 **5 Claims**



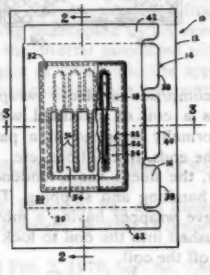
A walking beam conveyor of the kind which comprises a series of stationary beams and a series of walking beams which have a driving mechanism by which they are moved upwards relative to the stationary beams to lift workpieces therefrom, then longitudinally to convey the workpieces along the stationary beams and subsequently downwards again to replace the workpieces on the stationary beams is provided with a mechanism for raising and lowering the walking beams in such a way as to minimize the impact of the working beams on the workpieces as they raise the workpieces from the stationary beams. This mechanism includes a number of hydraulic fluid pressure operated cylinders which are connected to the walking beams and operate successively. A number of the cylinders move the walking beams upwards until they come into contact with the workpieces and are then stalled. One or more further cylinders are then brought into operation in sequence until there are sufficient cylinders to increase the force acting on the walking beams until the walking beams are able to lift the workpieces from the stationary beams after which the walking beams are moved longitudinally by a further hydraulic fluid pressure operated cylinder and the beams are then lowered again.

3,666,087

REUSABLE PACKAGE

Joseph Cooper, Westport, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 24, 1970, Ser. No. 66,241
Int. Cl. B65d *25/54, 73/00, 43/16*
U.S. Cl. 206—45.34 **1 Claim**



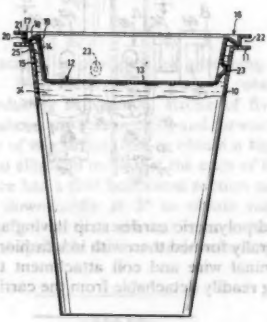
A package comprises a folded-over plastic sheet adhesively secured to a panel. The folded-over sheet comprises an article-carrying member and cover member which are hinged together and interfit in snap fastener fashion. Extensions on the cover may also be adhesively secured to the panel.

3,666,088

LIQUID CONTAINERS

Uno Wingardh, Morarp, Sweden, assignor to Sprinter Pack AB, Laholmsvagen, Halmstad, Sweden

Filed May 25, 1970, Ser. No. 40,325
Claims priority, application Sweden, June 18, 1969, 8687/69
Int. Cl. B65d *85/72, 39/04, 43/08*
U.S. Cl. 206—46 L **3 Claims**



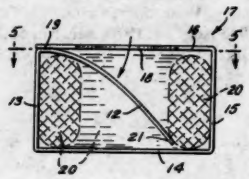
A liquid container comprising a cup, the contents of which have a more or less low viscous consistency, which is closed by a lid. Radially inwardly of the pouring edge of the cup the lid has a recess which comprises a bottom and an annular side wall, said side wall being spaced from the inside surface of the cup so as to present around a portion of its circumference a slot-like interspace between the inside surface of the cup and the annular side wall. The volume of liquid contained in the cup is such that the liquid, when the cup stands vertical, fills the whole of the cup below the bottom of the recess and fills at least a portion of the slot-like interspace.

3,666,089

SLEEVE WRAPPER CONSTRUCTION

Joseph G. Souza, East Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.

Filed Sept. 21, 1970, Ser. No. 73,957
Int. Cl. B65d 85/04
U.S. Cl. 206—52 W 6 Claims



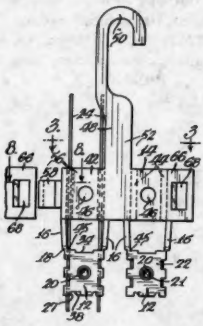
The device comprises a sleeve wrapper for a coiled product such as a coil of electrical wire or cable. Such products are normally wrapped in a paper or cardboard sleeve open at the ends. Instructions, etc., are printed on the sleeve. However, the sleeve has a tendency to slide off the product during handling and shipping. The present device comprises a sleeve wrapper having a movable wall portion which can be pushed into the coil to lock the sleeve against axial movement off the coil.

3,666,090

COIL FORM AND CARRIER STRIP

Richard A. Johnson, McHenry; Charles E. Jensen, and John O. Renskers, both of Crystal Lake, all of Ill., assignors to Coilcraft, Inc., Cary, Ill.

Filed Jan. 27, 1970, Ser. No. 6,157
Int. Cl. B65d 73/02, 85/62
U.S. Cl. 206—56 AB 5 Claims



A molded polymeric carrier strip having a plurality of coil forms integrally formed therewith in a fashion to permit automated terminal wire and coil attachment thereto, the coil forms being readily detachable from the carrier strip.

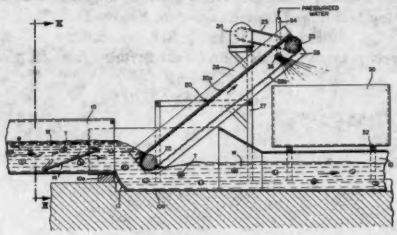
3,666,091

APPARATUS FOR SEPARATING FRUITS AND VEGETABLES FROM LEAVES, VINES, AND THE LIKE

William J. Ludlum, Moorestown, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Jan. 6, 1970, Ser. No. 956
Int. Cl. B03b 7/00
U.S. Cl. 209—12 6 Claims

Apparatus for separating fruits and vegetables from leaves, vines and the like which includes a flume containing a flow of water in which the fruits and plant waste material are carried; a series of generally upright, spaced-apart inclined rods located within and across the flume with upper ends inclined in the direction of flow; and an inclined endless belt having a flat, upwardly moving surface transverse to the direction of flow and a lower end in the flume. The angle of inclination and the speed of movement of the belt, together with the coarseness of its surface, causes the leaves and vines to adhere to the belt and be drawn out of the flume while the



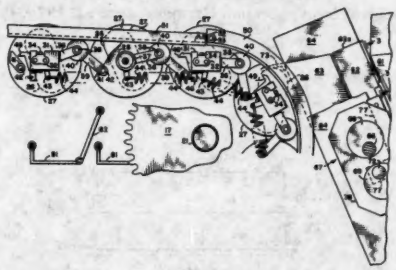
fruits roll down the belt to be carried along in the flume. The modification of this invention provides for the fruits, leaves and vines to be discharged on to the top of a similarly inclined, upwardly moving belt whereby the fruits roll down and off the belt to be collected for processing while the vines and leaves adhere to the belt and are carried upwardly to be discharged over the top and collected for disposal.

3,666,092

SIZER CONVEYOR

Earl R. Anderson, Los Gatos, Calif., assignor to Brex Corp., Los Gatos, Calif.

Original application Nov. 6, 1967, Ser. No. 684,893, now abandoned. Divided and this application July 6, 1970, Ser. No. 52,616
Int. Cl. B07b 1/16
U.S. Cl. 209—73 3 Claims



An endless series of grading elements are carried through a grading path and provide transverse grading openings between each adjacent pair. The product to be graded is fed row by row by a transverse feed member which is reciprocated in a timed manner by an essentially harmonic drive means.

3,666,093

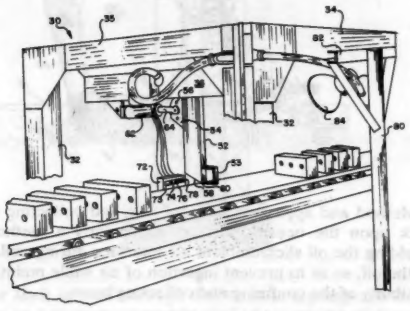
APPARATUS FOR SENSING AND EJECTING BRICKS OF IMPROPER SIZE

La Verne Thornton, Goldston, and Gerald L. Stuart, Siler City, both of N.C., assignors to Forrest Paschal Machinery Company, Siler City, N.C.

Filed Aug. 18, 1970, Ser. No. 64,740
Int. Cl. B07c 5/10
U.S. Cl. 209—74 13 Claims

Raw bricks are cut from an extruded column of clay and conveyed in single file past a sensing means including an inclined light path extending between a light source and a

plurality of photocells arranged linearly along one side of the conveyor. The light path cuts through one corner of each brick, and the photocell arrangement measures the thickness thereof. The sensing means is adapted for use with both "standard" and "utility" size bricks and also effective to determine undersize as well as oversize bricks. A brick ejecting means is mounted adjacent the conveyor, immediately succeeding the photocells, and is responsive to the sensing means to eject prescribed bricks of improper thickness. The ejecting means includes a pivotal kickoff lever attached to the free end of an air cylinder and so arranged as to deliver a



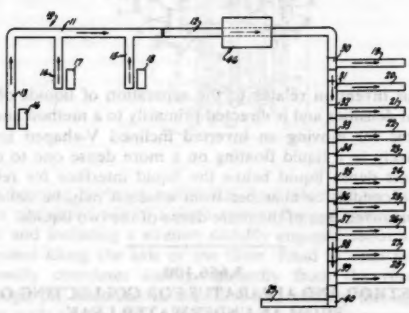
sharp blow to the end of a prescribed brick during the upward portion of its arcuate path. Such an arrangement imparts to the brick a strong, upward and outward movement without further or continuous engagement by the lever, and eliminates the frictional drag of the conveyor belt facilitating removal of the brick therefrom. The transverse path of the lever is angularly adjustable with respect to the conveyor path, so that the force imparted by the lever includes a longitudinal component along the conveyor path as well as a transverse component to utilize somewhat the impetus of the brick along the conveyor in lifting and removing it therefrom.

3,666,094

SONIC ARTICLE-SORTING SYSTEM

Stephen J. Martin, Miami, Fla., assignor to Spott Electrical Company, Hayward, Calif.

Filed May 1, 1969, Ser. No. 820,942
Int. Cl. B07c 5/344
U.S. Cl. 209—111.5 **17 Claims**



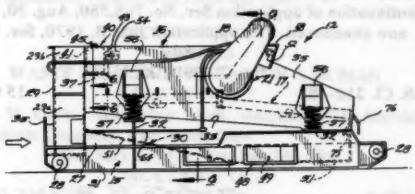
A sonic article-sorting system for processing passenger baggage at an airline terminal. A particular form of the system includes a conveyor having both a collection section along which baggage is accumulated and a distribution section providing a plurality of distribution branches or stations respectively corresponding to particular flight destinations and into which baggage is selectively diverted in accordance with the destinations thereof. A plurality of diverters disposed in respective association with the distribution branches are operative selectively to effect diversion thereinto of individual articles of baggage being advanced along the conveyor. Each article of baggage carries a tag equipped with an identification responder operative to transmit an ultrasonic signal corresponding to the destination indicated by the tag; and a plurality of interrogation units produce electromagnetic energizing signals adapted to intercept each article of baggage and the responder-equipped tag carried thereby. A plurality of sensors respectively connected with the diverters through control means are respectively responsive to the ultrasonic signals transmitted by the identification responders; and whenever a sensor responds to the ultrasonic signal of appropriate frequency resulting from the identification responder being intercepted by an energizing signal of proper frequency, the diverter associated with such sensor is actuated to segregate or divert into the appropriate branch the article of baggage carrying such transmitting responder.

3,666,095

VIBRATING SCREEN FOR FINE SCREENING OF LIQUIDS

Robert A. Krynock, Lansdale, Pa., and Robert W. Ruhe, Jr., Houston, Tex., assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 2, 1970, Ser. No. 7,869
Int. Cl. B07b 1/42
U.S. Cl. 209—254 **18 Claims**



A vibrating screen is provided for screening with cloths having 60 to 100 mesh openings. A rotary vibrator mechanism producing a minimum stroke of five-sixteenths inch is located above the screen cloth and forward of the longitudinal center of the screen box to obtain a high acceleration and unequal elliptical motion at the ends of the box. The screening surface has a first horizontal section and a second section sloped downwardly at 5° to obtain maximum dewatering on the first section and maximum retention on the second section. Adjustable flow control vanes are included in the feed flume.

3,666,096

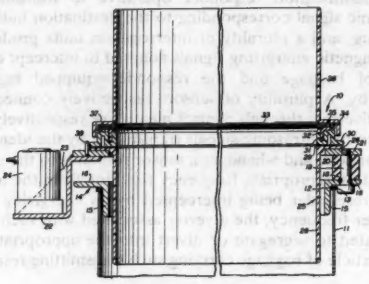
PORTABLE VIBRATING SCREENER

Laverne J. Riesbeck, and Willis A. Blackwell, both of Canton, Ohio, assignors to Midwestern Industries, Inc., Massillon, Ohio

Filed Nov. 28, 1969, Ser. No. 880,707
Int. Cl. B07b 1/28
U.S. Cl. 209—259 **9 Claims**

A portable material separator to be used with a container having an opening of any shape in the top thereof. A vibrating device is attached to a plane which rests on a plurality of cushions. The cushions are mounted on a base plate which fits within the opening in, and rests on top of, the container.

A screen spans the opening in the container and is mounted in a frame which rests on the plate and therefore receives



vibrations therefrom. A clamping means holds the above described assembly in a properly spaced relationship.

3,666,097

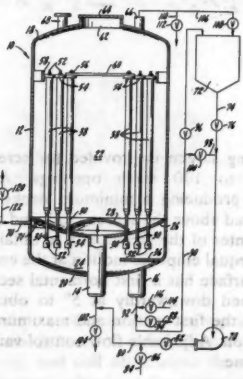
METHOD AND APPARATUS FOR CLEANING A FILTER CARTRIDGE

Leo F. Ryan, Somerville, N.J., assignor to Ecodyne Corporation, Chicago, Ill.

Continuation of application Ser. No. 768,580, Aug. 30, 1968, now abandoned. This application June 8, 1970, Ser. No. 48,809

Int. Cl. B01d *25/32*

U.S. Cl. 210—82 **15 Claims**



A method for cleaning pre-coated filter cartridges vertically mounted in a filter tank in which the tank is drained and then refilled by passing a mixture of air and water through the cartridges in reverse flow to their normal operation. As the tank fills with water, the filters are gradually cleaned from bottom to top. The tank may then be gradually drained while continuing the delivery of air to the interior of the cartridges. The invention also provides apparatus including a filter tank having gas distributors on the bottoms of the filter cartridge seat means. The gas distributors form a mixture of gas and liquid for delivery to the filter cartridges.

3,666,098

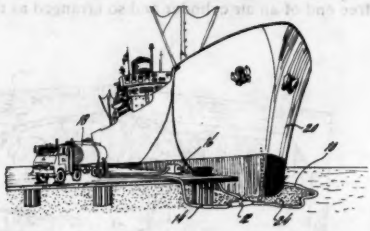
METHOD AND APPARATUS FOR CONFINING AND COLLECTING AN OIL SLICK

Charles Garland, Williamsburg; James J. Victory, and John P. Latimer, both of Newport News, all of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Sept. 8, 1970, Ser. No. 70,142

Int. Cl. B01d *37/00*

U.S. Cl. 210—83 **6 Claims**



Method and apparatus for confining and collecting an oil slick upon the ocean's surface, particularly a method for shielding the oil slick/ambient air interface during collecting of the oil, so as to prevent ingestion of air while maintaining flexibility of the confining and collecting boom.

3,666,099

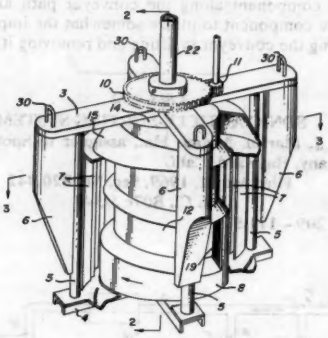
METHOD OF AND APPARATUS FOR SEPARATING LIQUIDS

Frank Galicia, 5043 Catherine St., Philadelphia, Pa.

Filed Nov. 6, 1970, Ser. No. 87,505

Int. Cl. E02b *15/04*

U.S. Cl. 210—83 **10 Claims**



This invention relates to the separation of liquids of different densities and is directed primarily to a method and apparatus for moving an inverted inclined V-shaped trough relatively to a liquid floating on a more dense one to carry the less dense liquid below the liquid interface for release into a conduit or chamber from which it may be collected and removed free of the more dense of the two liquids.

3,666,100

METHOD AND APPARATUS FOR COLLECTING OIL FROM AN UNDERWATER LEAK

Thaddeus A. Madej, 1223 Polk St., Hollywood, Fla.

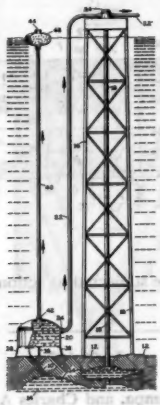
Filed Apr. 24, 1969, Ser. No. 818,868

Int. Cl. B01d *21/00*

U.S. Cl. 210—83 **2 Claims**

A method and apparatus for collecting oil from an underwater leak including the steps of (1) detecting the location of the leak, (2) submerging an inverted collector shell

under the water to a position directly over and enclosing the leak so that oil, being lighter than water, rises from the source of the leak into the collector shell and displaces water in the collector shell to partially fill the collector shell with oil, (3) providing a conduit leading from the submerged collector shell upward through the water to a pump and from a pump to a storage receptacle, and (4) pumping oil from the collector shell through the conduit to the storage receptacle with said pump. Also disclosed is apparatus for carrying out the method.

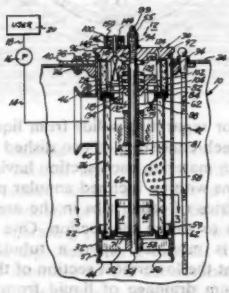


3,666,101

MULTIPLE FILTER DEVICE

Nils O. Rosaen, Bloomfield Hills, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Aug. 18, 1969, Ser. No. 850,730. The portion of the term of the patent subsequent to Feb. 3, 1987, has been disclaimed.
Int. Cl. B01d 27/10
U.S. Cl. 210—90 14 Claims



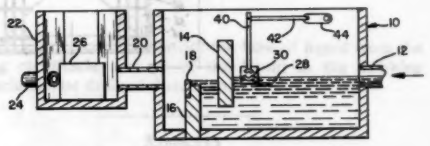
A housing having a cylindrical filter element for filtering fluid circulated within a fluid system from a reservoir to a user and including a strainer slidably engaged about a shaft disposed along the axis of the filter. Fluid in such systems normally circulates axially upwardly from the reservoir through the inlet end of the filter and radially through the filter walls to the user. A refill charge of fluid is poured axially downwardly through the cylindrical filter and the filter inlet into the reservoir, in a direction opposite to the normal fluid circulation. The strainer is supported for axial movement in response to the fluid flow from a first position in which the strainer engages a seat formed around the fluid inlet when the reservoir is being refilled so as to trap foreign matter carried therein, to a second position in which the strainer is substantially spaced apart from the filter inlet permitting unrestricted fluid flow between the reservoir and the filter walls during normal fluid circulation.

3,666,102

AUTOMATICALLY OPERATED OIL SEPARATOR SCUM TROUGH

Walter P. Blanchard, P.O. Box 64, Quincy, Mass.

Filed Sept. 15, 1970, Ser. No. 72,438
Int. Cl. B01d 21/24
U.S. Cl. 210—138 7 Claims



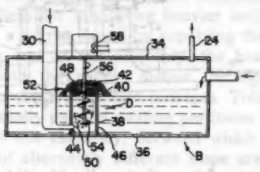
A timing control system is provided for automatically separating oil floating on the surface of water or the like and is useful in drainage systems for oil handling facilities and similar installations. A settling tank receives drains typically comprised of oil and water. A weir arrangement maintains the level of the drains at a predetermined height in the tank and a longitudinally slit scum pipe is disposed partly submerged across the surface of the liquids. A timing device automatically rotates the pipe so that the slit will allow the oil floating on the surface to drain from the tank, the water being separately removed through the weir.

3,666,103

WASTE DISPOSAL SYSTEM FOR A HUMAN CONVEYANCE

Harry W. Green, Ann Arbor, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed May 5, 1971, Ser. No. 140,492
Int. Cl. C02c 1/02
U.S. Cl. 210—152 3 Claims



A waste disposal system for a human conveyance includes a waste tank for receiving liquid and organic waste material. An aerating device for aerating waste material in the tank is operated by air pressure during movement of the conveyance to bubble air through waste material in the tank.

3,666,104

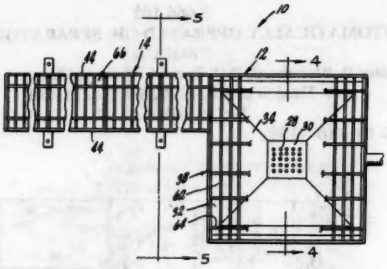
PREFABRICATED DRAIN APPARATUS

Theophil Aprill, Jr., and John R. Leerkamp, both of Ann Arbor, Mich., assignors to A & L Battery & Electric Service, Inc., Ann Arbor, Mich.

Filed Dec. 30, 1970, Ser. No. 102,703
Int. Cl. B01d 35/02
U.S. Cl. 210—164 7 Claims

Apparatus for use in constructing a drainage system for paved surfaces such as are found in automobile service stations and the like. The apparatus includes sheet metal sec-

tions which can be assembled at the site of use to serve as forms for an indefinite length about which concrete can be



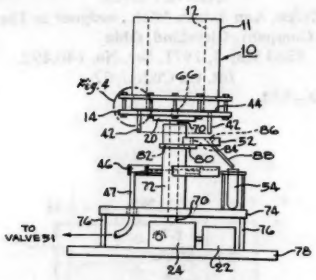
poured and which then remain as integral parts of a trench drain and sump assembly.

3,666,105

APPARATUS FOR CONTINUOUS LIQUID-SOLID PHASE CHROMATOGRAPHY

Jay B. Fox, Jr., Ambler, Pa., assignor to The United States of America as represented by the Secretary of Agriculture

Filed Aug. 4, 1970, Ser. No. 60,447
Int. Cl. B01d *15/08*
U.S. Cl. 210—198 **1 Claim**



An apparatus for continuous liquid-solid phase chromatography having a column formed by two concentric cylinders clamped to a bottom plate which rests on a turntable operably connected to a drive means. A flat fixed phase bed surface for even layering of a solution and uniform entry of solution into the fixed phase is obtained by a unique accessory, a leveling plow.

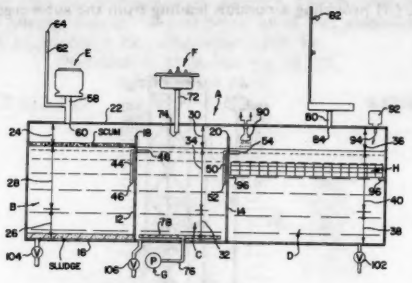
3,666,106

APPARATUS FOR MULTI-STAGE TREATMENT OF WASTE MATERIAL

Harry W. Green, Ann Arbor, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed May 5, 1971, Ser. No. 140,532
Int. Cl. C02c *1/02*
U.S. Cl. 210—201 **6 Claims**

A waste disposal system includes three interconnected tanks. Waste material is subjected to anaerobic bacterial action in a first tank and then transferred to a second tank. The waste material is subjected to aerobic bacterial action in the second tank and is then transferred to the third tank. The



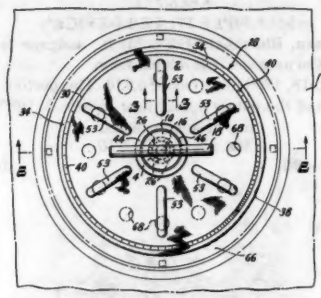
waste material may be subjected to action of a treating agent in the third tank.

3,666,107

FILTER UNIT

Weldon C. Boggs, Tampa, and Charles A. Turcotte, Daytona Beach, both of Fla., assignors to Food Research & Equipment Company, Tampa, Fla.

Filed Sept. 17, 1970, Ser. No. 73,015
Int. Cl. B01d *35/02, 29/34*
U.S. Cl. 210—238 **12 Claims**



A filter unit for separating solids from liquids comprising filter elements each consisting of two dished diaphragm sections of fine mesh material, each section having an inner and outer rim portions with an inclined annular portion adjacent thereto and a series of radial ribs in the area between said inclined portions to stiffen the section. One or more of the filter elements is mounted upon a tubular core having openings adjacent the lowermost section of the filter unit for effecting maximum drainage of liquid from the filter unit. The core is threaded at its lower end for mounting upon an outlet fitting in a housing. A handle is attached to the upper end of the core to facilitate mounting and removal of the filter unit from the housing.

3,666,108

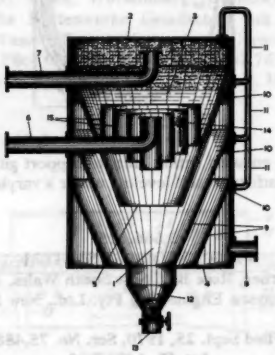
SEPARATOR FOR LIQUIDS OF DIFFERENT SPECIFIC GRAVITIES

Cornelis in 't Veld, Vlaardingen, Netherlands

Filed Apr. 20, 1970, Ser. No. 30,091
Int. Cl. B01d *21/10, 35/00*
U.S. Cl. 210—305 **3 Claims**

A separator for liquids of different specific gravities, such as oil and water, comprises a tank having a hopper therein

with downwardly convergent side walls and an open bottom which is spaced above the bottom of the tank, the top of the hopper being closed by the top of the tank. Oil-water mixture is fed to an intermediate level of the hopper, and oil is withdrawn from the top of the tank and water from the bottom of the tank on the opposite side of a filter that passes water but not oil. The downward convergence of the hopper



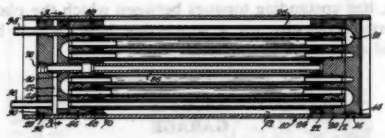
walls lengthens the path through which the water must travel during separation, thereby to reduce the entrainment of oil in the water. Vertical anti-turbulence baffles are positioned in the hopper, as well as a sensor responsive to the presence of oil to control the device. By-pass conduits return to the top of the hopper the oil that accumulates in the tank outside the hopper.

3,666,109

REVERSE OSMOSIS LIQUID SEPARATION APPARATUS

Richard W. Goeldner, New Berlin, Wis., assignor to Aqua-Chem, Inc.

Filed Apr. 23, 1970, Ser. No. 31,195
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—321 **6 Claims**



A membrane module for use in solvent separation by reverse osmosis. Tubular membranes are mounted in liquid impervious thin-walled tubes, all within a pressure vessel, with a conduit provided for directing a liquid mixture under reverse osmosis operating pressure to the interior of the tubular membranes together with a conduit for receiving the solvent from the interface of the membranes and the liquid impervious tubes. There is also provided a conduit communicating with the high pressure liquid mixture flow path to provide liquid under the high pressure to the exterior of the liquid impervious tubes to thereby provide a support for the tubes and thus, the membrane therewithin, during reverse osmosis operating conditions.

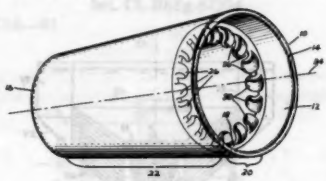
3,666,110

DRINKING RECEPTACLE

Frederick R. Hodges, 520 N. Michigan Ave., Chicago, Ill.

Filed June 22, 1970, Ser. No. 48,162
Int. Cl. B01d *23/20*
U.S. Cl. 210—469 **3 Claims**

A drinking receptacle having means for maintaining ice, fruit, and the like within the receptacle and spaced from the rim thereof during use. The receptacle comprises a guard spaced from the rim of the receptacle. The guard has a plurality of spaced openings therein through which liquids will



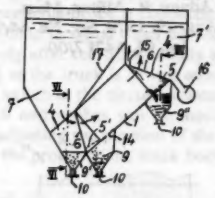
pass. The guard does not restrict the flow of liquid from the drinking receptacle and all of the liquid in the drinking receptacle can be drained therefrom.

3,666,111

SEPARATION DEVICE

Jacob Pielkenrood, and Willem L. B. Ambrosius, both of Krommenie, Netherlands, assignors to Pielkenrood-Vinitex N.V., Assendelft, Netherlands

Filed June 18, 1970, Ser. No. 47,575
Claims priority, application Netherlands, June 28, 1969, 6909973; Sept. 29, 1969, 6914731
Int. Cl. B01d *21/02*
U.S. Cl. 210—521 **21 Claims**



A separation device comprising substantially parallel sloping passages in an assembly of corrugated bordering surfaces with tops and valleys for separating heavier and/or lighter components from a carrier liquid by supplying the liquid to be treated at one end of this assembly, the heavier components sinking into the valleys and/or the lighter components rising into the tops of said passages. This device is provided with mutually parallel guiding partitions at least at the supply side of this assembly, between which partitions transverse plates of alternately different slope are provided for delimiting mutually separated channels communicating with the tops or the valleys of said passages respectively, in order to suppress turbulences in the liquid and preventing remixing of the separated substances. Auxiliary partitions may be provided for improving the liquid distribution and/or for classification of the separated substances.

3,666,112

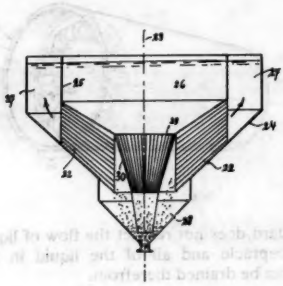
SEPARATION DEVICE

Jacob Pielkenrood, and Willem L. B. Ambrosius, both of Krommenie, Netherlands, assignors to Pielkenrood-Vinitex N.V., Assendelft, Netherlands

Filed June 18, 1970, Ser. No. 47,576
Claims priority, application Netherlands, June 8, 1969, 6,909,974; Aug. 4, 1969, 6,911,882; 6,911,883
Int. Cl. B01d *21/02*
U.S. Cl. 210—521 **14 Claims**

A separating device comprising an assembly of sloping passages, in which components of a liquid moving through

this assembly are separated therefrom, which components are separately removed at an extremity of this assembly. This assembly is composed of tubes, troughs or corrugated plates delimiting sets of plural passages connected by narrower channels, the liquid to be treated being supplied to one

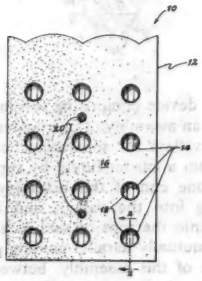


passage, and the separated components passing through a connected channel into another passage, from which it may be removed out of contact with the liquid. Special guiding partitions may be arranged at a discharge end of such an assembly for suppressing turbulences.

3,666,113
HOLDER FOR LIGHT BULBS

Dean Wm. Burrell, 35 Jefferson St., Ellicottville, N.Y.; Paul A. Costello, 27 Stevens Rd., Needham, Mass., and Robert C. Costello, 349 Adams St., Milton, Mass.

Filed Aug. 19, 1970, Ser. No. 64,967
Int. Cl. A47f 7/00
U.S. Cl. 211—26 **3 Claims**



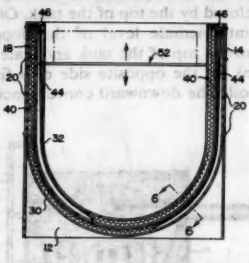
A holder for spare light bulbs including a generally rectangular board of molded plastic foam material having a plurality of cavities opening through one surface of the board and arranged in a uniform geometric pattern formed of aligned columns and rows. Bulb holding screw sleeve devices are friction fitted one in each of the cavities.

3,666,114
DISPLAY RACK

Ardell Davis, 3811 De Leon Ave., Tampa, Fla.

Filed Aug. 5, 1970, Ser. No. 61,137
Int. Cl. A47f 7/00
U.S. Cl. 211—49 R **12 Claims**

A self-leveling dispenser and display rack including a support frame, a horizontally displaced platform, a plurality of springs for supporting the platform within the frame. The

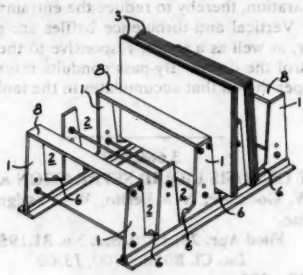


springs being encased within arcuate support guide members so that the platform is self-leveling under a varying load.

3,666,115
PLATE STORAGE SYSTEM

Raymond Turner, Rose Bay, New South Wales, Australia, assignor to Rayson Engineering Pty. Ltd., New South Wales, Australia

Filed Sept. 25, 1970, Ser. No. 75,488
Int. Cl. A47f 7/00
U.S. Cl. 211—50 **11 Claims**

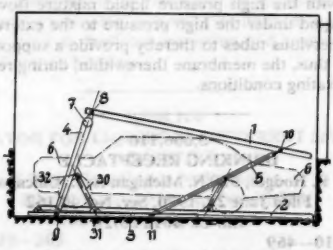


A storage device for plate materials, particularly steel plates, has upstanding tongues between which the plates are supported edgewise on a supporting base, which base is located at an angle to the horizontal.

3,666,116
GARAGE

Kaspar Klaus, 46 Schlachthofstrasse, Memmingen, Bavaria, Germany

Continuation of application Ser. No. 872,431, Oct. 29, 1969, now abandoned, which is a continuation of application Ser. No. 611,003, Jan. 23, 1967, now abandoned. This application Oct. 7, 1970, Ser. No. 78,965
Claims priority, application Germany, Feb. 1, 1966, K 58290
Int. Cl. E04h 6/06
U.S. Cl. 214—16.1 ED **8 Claims**



A garage including two mobile platforms for motor vehicles arranged one above the other, the lower platform being

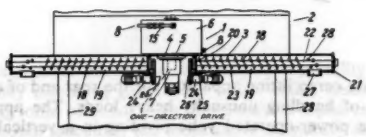
rotatable about an axis located at the end remote from the entrance to the garage, and the upper platform being connected with the lower platform in such a manner that either platform can be selectively placed adjacent the entrance.

3,666,117

SILO DISCHARGING DEVICE

Hans Gessler, Aalen, Wurtemburg, Germany, assignor to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung, Wasseralfingen, Wurtemburg, Germany

Filed Oct. 1, 1969, Ser. No. 862,761
Claims priority, application Germany, Oct. 2, 1968, G 68 00 301
Int. Cl. B65g *65/48*
U.S. Cl. 214—17 D 26 Claims



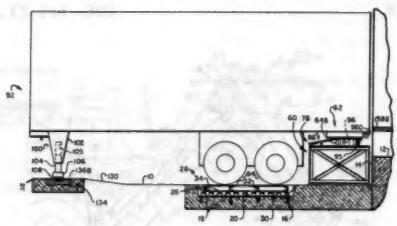
A silo discharging device with an operable conveyor element leading to a discharge opening and with a rotary motor driven cutter located above said conveying element in which the rotary cutter with the motor driving the same forms a structural unit which is separate from the conveying element.

3,666,118

SYSTEM FOR POSITIONING A WHEELED CARRIER

Burt F. Raynes, Chula Vista; Necati Kanatsiz, Spring Valley, and Robert E. Ottle, San Diego, all of Calif., assignors to Rohr Corporation, Chula Vista, San Diego, Calif.

Filed July 27, 1970, Ser. No. 58,351
Int. Cl. B65g *69/24*
U.S. Cl. 214—38 B 6 Claims



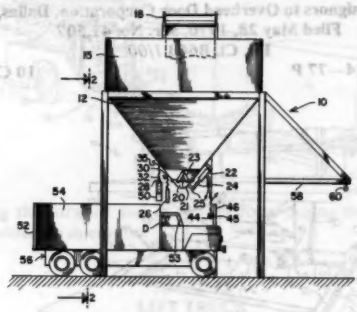
A carrier having wheels at the rear thereof is moved to a selected location on a surface by means of a system which includes a centering deck supported on said surface for movement in any direction thereon and a notched centering member fixedly positioned on one side of said centering deck. The centering member is spaced above the aforesaid surface, and a pin depending from the rear of the carrier engages one wall of the notch in the centering member as the wheels of the carrier roll across the centering deck toward the centering member. Springs are arranged to resiliently bias the centering deck into a desired alignment relative to the centering member, and ramps are fixedly positioned on opposite sides of the latter to lift the rear of the carrier as it rolls across the centering deck. Centering plates are located on the aforesaid surface at a predetermined distance from the centering deck and supports are mounted on the forward end of the carrier, the lower ends of said supports moving to the centers of the centering plates when supported on the sloped upper surfaces of the latter.

3,666,119

AUTOMATIC LOADING AND SIGNALING SYSTEM FOR DRIVER OPERATED VEHICLES

Ward H. Parsons, 1202 Green Glen Rd., Birmingham, Ala.

Filed Sept. 25, 1970, Ser. No. 75,404
Int. Cl. B65g *67/04*
U.S. Cl. 214—41 9 Claims



A truck loading system for loading an open top truck with material discharged from an overhead bin at a loading station. The bin has a gate operated by electromechanical means. An omnidirectional loading probe is connected in a circuit with the electromechanical means and with a signal lamp visible to the driver for closing the gate and turning on the lamp when the probe is tilted by material in the truck. A second omnidirectional probe is connected in the circuit with a second signal lamp to signal when the second probe is tilted by the truck body after the truck is fully loaded, and to lock the gate closed as the truck is driven away from the loading station. A start switch in the circuit initiates opening the gate. The start switch and probes can be mechanically interconnected so that adjusting the position of the start switch selectively positions the probes in the truck body.

3,666,120

MECHANICALLY EXTENDIBLE TELESCOPING BOOM

T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Wilfred H. Bachle, 2502 Monogram AVe., Long Beach, Calif.

Filed Feb. 4, 1970, Ser. No. 8,650
Int. Cl. B66b *17/00*
U.S. Cl. 214—90 R 8 Claims

A crane capable of being employed as a back-hoe for digging, gathering, collecting or recovering bulk materials, such as soil particles or the like, characterized by a boom assembly including a plurality of telescoping boom segments pivotally supported on a rotatable base and including a plurality of flexible tape members interconnecting the segments and adapted to be selectively tensioned for imparting selective rectilinear displacement to the segments for thereby telescopingly elongating and contracting the boom assembly, a feature of the invention being a furlable tape adapted to be flattened and wound about a tape take-up drum as the boom

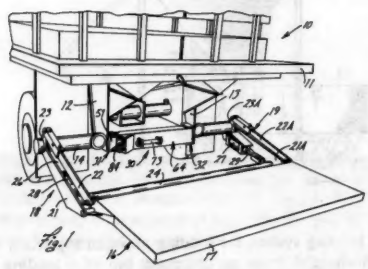
assembly is contracted and deployed into an elongated tubular conduit extending axially between the opposite ends of the boom assembly as it is elongated, whereby a variable length fluid conduit is provided between the distal end and the base of the boom assembly.

3,666,121

TRAILER HITCH

David L. Denner, and Herbert E. Warner, both of Toledo, Ohio, assignors to Overhead Door Corporation, Dallas, Tex.

Filed May 28, 1970, Ser. No. 41,507
Int. Cl. B60d 1/00
U.S. Cl. 214—77 P 10 Claims



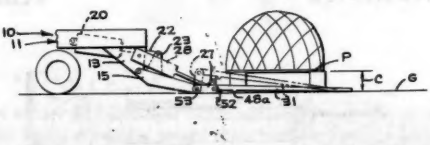
A trailer hitch comprising two arms pivotally supported upon the mounting means by which a lift mechanism is supported upon a vehicle. The arms are movable between substantially parallel positions adjacent the mounting means, where they do not interfere with the upward and downward movement of the lift mechanism, and extended positions in which their free ends are interconnected, one of said arms supports a hitch ball and both said arms include means whereby the same pin can hold the arms in either the extended positions or the retracted positions.

3,666,122

MOVABLE LOAD SUPPORT FOR SELF LOADING VEHICLE

Donald W. Youmans, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 9, 1970, Ser. No. 70,738
Int. Cl. B60p 1/48
U.S. Cl. 214—77 R 6 Claims



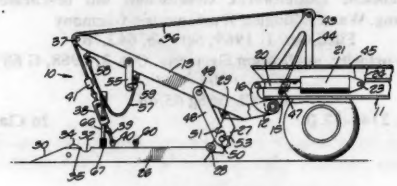
A self-loading vehicle has a vertical swinging load support that includes a load engaging element of a fork type insertable under a pallet for loading the pallet onto the vehicle. Pivotally connected to the load engaging element is a link coupled to the vehicle by a linkage for swinging the link vertically and maintaining the link at a constant angular orientation with the horizontal during vertical swinging movement. A strut is pivotally connected to the link and engageable with a stop on the load engaging element for maintaining a horizontal position of the load engaging element during vertical swinging movement. The linkage includes an extensible link for pivoting the link connected to the load engaging element to a horizontal position which facilitates insertion of the load engaging element under a pallet with a minimum clearance.

3,666,123

TAILGATE CARGO LIFTING APPARATUS FOR THE REAR END OF A TRUCK

Harold Tornheim, 430 N. Auburn Ave., Sierra Madre, Calif.

Filed Jan. 20, 1971, Ser. No. 107,991
Int. Cl. B60p 1/48
U.S. Cl. 214—77 P 20 Claims



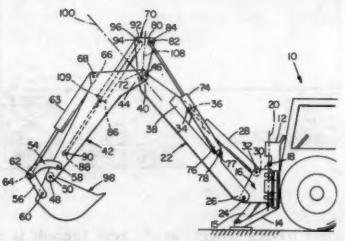
Tailgate cargo lifting apparatus for the rear end of a truck capable of handling unusually heavy loads. The apparatus utilizes a power-operated yoke pivoting in a vertical plane and employing linkage and flexible line means to maintain the cargo support platform level while swinging it in an arc between the rear end of the truck and the ground. The cargo platform may be a single rigid structure or formed in major and minor sections hinged together transversely of the truck for compact stowage in an upright position when not in use. The apparatus includes provision for using the power drive to aid in pivoting the platform to its fully retracted position.

3,666,124

LIFTING AND EXCAVATING APPARATUS

Carroll H. Arnold, Westminster, Mass., assignor to Wain-Roy, Hubbardston, Mass.

Filed Oct. 15, 1970, Ser. No. 81,002
Int. Cl. E02f 3/74
U.S. Cl. 214—138 7 Claims



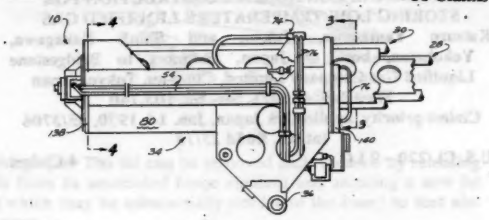
An improved construction for a backhoe which has a supporting member, a boom having a longitudinal axis and being pivotally connected at one end to the supporting member and arranged to be rotated at that end about a first horizontal axis and swung at that end about a vertical axis, a dipper stick pivotally connected to the boom, arranged to be rotated with respect to the boom about a second horizontal axis and arranged to have connected thereto, at the end remote from the second horizontal axis and the boom, elements, respectively for excavating and lifting. According to the improvement the boom and the dipper stick are pivotally connected to each other at their adjacent ends and the backhoe includes a mechanism connected both to the boom and the dipper stick for rotating the dipper stick about the second horizontal axis on either side of the longitudinal axis of the boom.

3,666,125

BOOM ASSEMBLY

John W. Gano, and Paul W. Schlafly, both of New Philadelphia, Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Sept. 10, 1970, Ser. No. 70,954
Int. Cl. E02f 3/00
U.S. Cl. 214—141 16 Claims



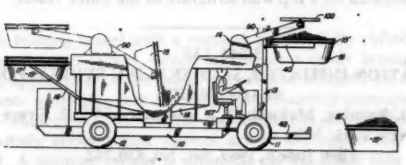
An extendable boom assembly includes a plurality of longitudinally extending guide walls which define channels for receiving loops or bends in flexible conduits. Upon extension of the boom assembly, the loops move outwardly along the channels into engagement with rollers of a biasing assembly. The biasing assembly tensions the flexible conduits during continued extension of the boom assembly. The biasing assembly also initiates inward movement of the loops along the channels in a predetermined manner when the boom assembly is retracted. Structural frame members of the boom assembly are connected with the flexible conduits and conduct fluid under pressure from the flexible conduits to a device mounted on an outer end portion of the boom assembly.

3,666,126

FRUIT CONTAINER PICKUP VEHICLE

Dietrich G. Rempel, Akron, Ohio, assignor to Rempel Enterprises, Inc., Akron, Ohio

Filed Aug. 28, 1970, Ser. No. 67,900
Int. Cl. B65g 67/02
U.S. Cl. 214—302 8 Claims



A vehicle having lifting means at its front end to raise a container filled with fruit from the ground to a position for engagement and support by a carriage movable rearwardly over the vehicle. A hopper is normally supported on the vehicle below the carriage which is adapted to dump the filled containers into the hopper, there being means to raise the hopper to an unloading position. The carriage is adapted to stack emptied containers at the rear of the vehicle and to pick up and transfer the stack to another vehicle.

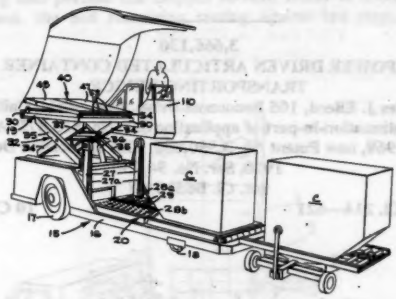
3,666,127

CARGO HANDLING APPARATUS

James R. Guyaux, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed June 22, 1970, Ser. No. 48,229
Int. Cl. B60p 1/02
U.S. Cl. 214—512 8 Claims

An aircraft cargo-handling vehicle has an elevatable platform adapted to be raised approximately to the level of the sill of the aircraft cargo door, said platform being provided with a transfer bridge so connected to the platform that it can be extended from the platform to the aircraft sill for supporting the forward end of the platform during the loading and unloading operation.

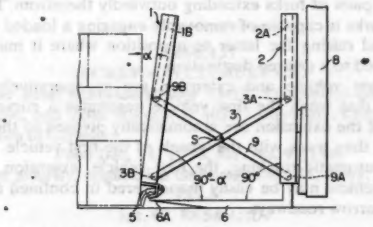


3,666,128

LIFT TRUCK

Masahiko Shimizu, Chita-ku, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Aichi, Prefecture, Japan

Filed June 12, 1970, Ser. No. 45,868
Int. Cl. B60p 1/04; B66f 9/16, 9/19
U.S. Cl. 214—514 9 Claims



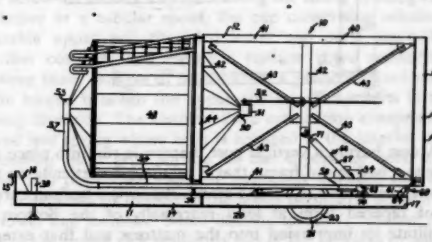
This invention relates to a lift truck provided with a load handling device comprising a push-pull attachment having a pushing frame and means adapted to be put into operation according to the tendency of the forward tilting motion of said pushing frame for cancelling parallelism of the pushing frame and a mast, thereby preventing any occurrence of disorder of the load.

3,666,129

DETACHABLE STORAGE BIN AND TRAILER

Roy Haskins, P.O. Box 4215, Station B, Spokane, Wash.

Filed Feb. 16, 1970, Ser. No. 11,609
Int. Cl. B60p 1/02
U.S. Cl. 214—515 1 Claim



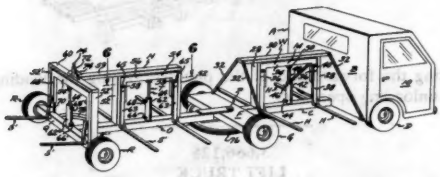
A detachable storage bin and trailer assembly is described having a storage bin that is releasably, pivotally attached to a

trailer. The trailer frame can be lowered to the ground to provide a sturdy support for erecting the storage bin. After the bin is erected release pins are pulled to detach the storage bin from the trailer.

3,666,130
POWER DRIVEN ARTICULATED CONTAINER TRANSPORTING DEVICE

Charles J. Ellerd, 105 Panorama Drive, Bakersfield, Calif.

Continuation-in-part of application Ser. No. 815,875, Apr. 14, 1969, now Patent No. 3,550,802. This application Dec. 3, 1970, Ser. No. 94,738
Int. Cl. B65f *3/08*
U.S. Cl. 214—621 **10 Claims**



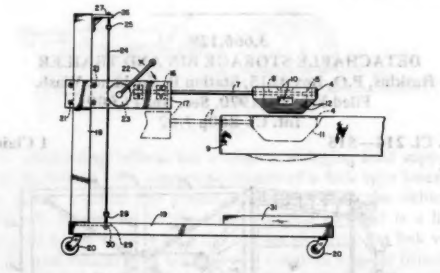
A first power driven vehicle having a pivoted wheel supported extension situated rearwardly therefrom, and the extension capable of having a wheel supported second vehicle pivotally connected thereto. The first vehicle, extension, and second vehicle have a number of power operated, vertically movable pairs of forks extending outwardly therefrom. Each pair of forks is capable of removably engaging a loaded container and raising the latter to a position where it may be transported to a desired destination.

The first vehicle and extension are so operatively associated that when the first vehicle negotiates a curve the wheels of the extension are automatically pivoted to the extent that they track with the wheels of the first vehicle. Due to this automatic tracking, the first vehicle, extension, and second vehicle may be easily maneuvered in confined areas and on narrow roadways.

3,666,131
PORTABLE BEDPAN CARRIER

Wilbur O. Thompson, 815 South Second St., DeKalb, Ill.

Filed Aug. 21, 1969, Ser. No. 851,997
Int. Cl. B66f *9/00*
U.S. Cl. 214—621 **11 Claims**

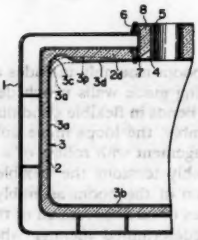


A cart having a vertical post thereon is run into place adjacent a bed and a frame that is adjustable vertically on the post by operation of a hand-crank, supports a bedpan carrier is of tapered form at least marginally of the bottom to facilitate its impression into the mattress and that extends over the mattress on the bed and is adapted to be impressed into the mattress to the point where the bedpan in the carrier is disposed substantially flush with the top of the mattress with minimum open space left around the carrier. After use of the bedpan, the carrier with the bedpan in it, is removable from the support to facilitate emptying the bedpan and cleaning and sanitizing both the pan and carrier.

3,666,132
MEMBRANE CONTAINER CONSTRUCTION FOR STORING LOW-TEMPERATURE LIQUIFIED GAS

Katsuro Yamamoto, Tokyo, and Shinji Nakagawa, Yokohama, both of Japan, assignors to Bridgestone Liquified Gas Company Limited, Chuo-ku, Tokyo, Japan

Filed Jan. 4, 1971, Ser. No. 103,740
Claims priority, application Japan, Jan. 14, 1970, 45/3706
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 LG **4 Claims**



A container or carrier for storing a low-temperature liquified gas in which a thin, metallic, film or membrane fluid-containing inner vessel composed of a bottom wall, side walls and a top having a central opening has a flexible bulge developed on the top in the area of juncture of the top and side walls and this bulge straightens in cross section for compensating for temperature decreases and loading for the inner vessel with a liquified gas. The internal pressure of the inner vessel is supported by a rigid, outer vessel in which a heat-insulating layer of compression-resistant material is installed. The strength of the inner vessel is maintained by the compensating deformations and at the same time leakage of liquid is prevented. Pipes lead into the inner vessel through a trunk mounted on a top wall structure of the outer vessel.

3,666,133
RADIATION-INITIATED, SELF-SEALING SYSTEM FOR SPACECRAFT

Calvin J. Benning, Mahwah, N.J., assignor to W. R. Grace & Co., New York, N.Y.

Filed June 5, 1969, Ser. No. 830,742
Int. Cl. B65d *25/00;* **B65h** *1/00*
U.S. Cl. 220—15 **9 Claims**

A space vehicle containing a double-walled closure can be made self-sealing by placing a viscous photocurable material (can be slightly pressurized) in the hollow portion of the double-walled closure. When a meteorite pierces both walls, the internal pressure forces some of the photocurable material into the hole in the outer wall. A seal is rapidly formed as the photocurable material is photocured by ultraviolet light into a hardened substance.

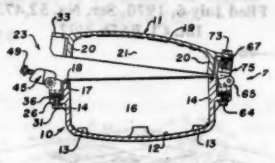
3,666,134
HOUSING FOR ELECTRICAL EQUIPMENT

Gerhard J. Rauch, Burnaby, British Columbia, Canada, assignor to Cascade Electronics Ltd., Port Moody, British Columbia, Canada

Filed June 29, 1970, Ser. No. 50,478
Int. Cl. B65d *51/04;* **A47j** *36/10*
U.S. Cl. 220—31 R **3 Claims**

An electrical housing particularly but not exclusively for cable television amplifier units. The housing has a base and a

lid which are hinged together by one or usually more pairs of hinge elements. One of each pair being releasably received in a socket on the lid and the other being releasably secured in a socket on the base, the two elements being joined by a



hinge pin. The lid can be removed and replaced by releasing it from its associated hinge element and securing a new lid (which may be substantially similar to the base) to that element.

3,666,135

VERTICAL HEATING VESSEL WITH A BURNER DISPOSED ON ITS UPPER SIDE

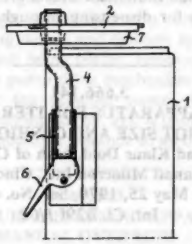
Edwin Kindle, Schaan, Liechtenstein, assignor to Gustav Ospelt Hovalwerk A.G., Vaduz, Liechtenstein

Filed Oct. 29, 1970, Ser. No. 84,999

Claims priority, application Luxembourg, Nov. 4, 1969, 59.742

Int. Cl. B65d *43/26*

U.S. Cl. 220—36 **1 Claim**



A heating vessel with a vertical, substantially cylindrically shaped water jacket, which comprises a cover arranged on the upper side of the water jacket and adapted to carry a burner projecting into a combination chamber surrounded by the water jacket. A vertical crank-like rod carries the cover pivotally about a first vertical axis at the upper end of the rod. A support means is arranged on the outer side of the heating vessel bearing at its lower end the crank-like rod swingably about a second vertical axis and displaceably in the direction of the second vertical axis. An eccentric lever lifts the crank-like rod by cooperation between the lower end of the rod and the eccentric lever in the support means. The eccentric lever has a curved path, and the latter has a plane face supporting the crank-like rod in its lifted position.

3,666,136

SEALING STOPPER

Maria del Carmen Murga Lopez, Valmaseda (Vizcaya), Spain

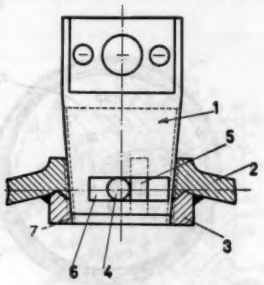
Filed Oct. 9, 1970, Ser. No. 79,528

Claims priority, application Spain, Feb. 18, 1970, 156001

Int. Cl. B65d *41/04*

U.S. Cl. 220—39 R **4 Claims**

A sealing stopper comprising a stopper having a bottom portion, and a substantially transverse recess formed from the side of the bottom portion, a limiting stop secured to the stopper and disposed in the recess, and a bearing ball movably disposed in the recess. The recess has a depth adjacent the stop at least equal to the diameter of the bearing ball and the recess includes ends remote from the stop having a depth less than the diameter of the bearing ball, whereby the stop limits the path of the ball in the recess so that the bearing ball permits the stopper to turn freely in a closing direction, the ball remaining resting against the stop, and



subsequently when turning the stopper in the opposite direction of opening, the ball is moved towards the remote end and becomes wedged between the stopper and the thread of a cap of a container in which the stopper is adapted to be inserted, destroying the cap and making the container useless.

3,666,137

SCREW-ON CLOSURE CAP

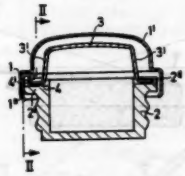
Werner Blau, Schneiderstrasse 13-17, Langenfeld-Immigrath (BRD), and Theo Gerdes, D 4018 Langenfeld, Lortzingweg 9, both of Germany

Filed Dec. 11, 1970, Ser. No. 97,194

Claims priority, application Germany, Dec. 11, 1969, P 19 62 187.5

Int. Cl. B65d *41/04*

U.S. Cl. 220—39 R **3 Claims**

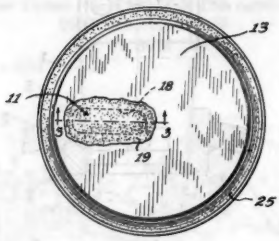


A screw-on closure cap for closing the filling opening of a container or a tubular spout, the cap comprising relatively rotatable upper and threaded lower cap parts assembled together coaxially and having a resilient drive connection between them capable of transmitting a predetermined maximum torque between the upper and lower cap parts in the closing direction. The resilient drive connection comprises a bowed leaf spring whose arch is engaged in the interior of a pressed-up hand grip portion of the upper cap part, and whose two out-turned ends are resiliently engaged ratchetwise in depressions formed in the upper peripheral portion of the lower cap member. When limiting torque is reached the ends of the spring ride resiliently out of the recesses to allow the upper cap part to turn relatively to the lower cap part without further tightening the closure cap on the neck of the container or spout.

3,666,138
CONTAINER CLOSURE

Robert J. Morris, Jr., Lisle, and Thomas Jayes Hartz, Downers Grove, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Filed June 15, 1970, Ser. No. 46,312
Int. Cl. B65d *17/20, 17/14*
U.S. Cl. 220—53 11 Claims

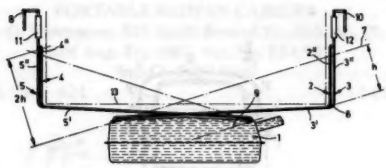


A metal container having a preformed aperture sealed on a side with an easy open tape laminate made of a flexible strip and a pressure sensitive adhesive. The exposed edge of the preformed aperture in the closure is coated with a cured coating composition comprising a low molecular weight epoxy resin and a urea-formaldehyde curing agent.

3,666,139
TANK

Norbert Urban, Rotgersbuttel, Germany, assignor to Volkswagen Aktiengesellschaft, Wolfsburg, Germany

Filed Nov. 30, 1970, Ser. No. 93,758
Claims priority, application Germany, Dec. 2, 1969, 19 60 651.1
Int. Cl. B65d *25/00*
U.S. Cl. 220—85 S 8 Claims

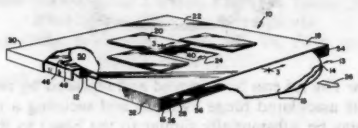


A container, especially a fuel tank for a motor vehicle, having a top wall and opposite side walls, comprising a plurality of conduits for connecting the interior of the container with the atmosphere, each of the conduits having a first, substantially horizontally extending section, when the container is in its normal substantially horizontal position and extending from an opening in the interior at one side wall toward the opposite side wall, the first section merging into a substantially vertically extending second section of the respective conduit at a sharply bent portion thereof, the conduits being of such dimension that, upon inclination of the container from the normal position, gases forming in the interior rise to the respective bent portion of those conduits, the first sections of which point downwardly, and that the liquid level in those conduits the first sections of which point upwardly is prevented from being lifted out of the second sections of the conduits.

3,666,140
STORAGE AND DISPENSING PACKAGE FOR STACKED SHEET MATERIAL

Paul E. Brefka, Southboro, and Peter A. Latham, Newburyport, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed July 6, 1970, Ser. No. 52,473
Int. Cl. B65h *3/02*
U.S. Cl. 221—46 13 Claims



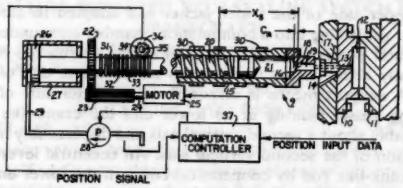
Sheet material stacked in groupings, each with two protective sheet-like covers above and below each piece of sheet material and having lesser friction therebetween than with the sheet material, readily dispenses by sliding a single grouping from the stack.

A package for storing and dispensing stacked sheet material has a sleeve-type container slidably receiving a tray that carries the sheet material in a recess having walls conforming to the peripheral edges of the sheet material. A loading member overlies the sheet material on the tray and has a void therethrough aligned under an opening in the container top panel through which individual sheets are urged forward out of the tray recess for dispensing through an opening in the sleeve container.

3,666,141
METHOD AND APPARATUS FOR ITERATIVE CONTROL OF SHOT SIZE AND CUSHION SIZE

Carlton Y. Ma, and Klaus Dold, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 25, 1970, Ser. No. 40,093
Int. Cl. B29f *1/02*
U.S. Cl. 222—1 12 Claims



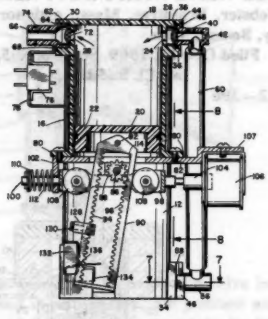
Apparatus and method for controlling the axial movement of a ram member inside a barrel within which fluent material is processed and subsequently discharged from one end thereof by the ram member. Both the length of the stroke of the ram member and the end point of its path of travel are controlled to maintain a uniform volume of material discharged from the barrel during each stroke of the ram member after the apparatus has reached a substantially steady state condition. In the course of startup of the machine, the control system automatically adjusts the stroke of the ram member during the initial operating cycles to achieve a predetermined end point in its path of travel and to provide the necessary shot size.

3,666,142

BEVERAGE DISPENSING APPARATUS HAVING ADJUSTABLE PISTON STROKE

Raymond E. Gust, Spring Valley, Calif., assignor to Courtesy Products Corporation, San Diego, Calif.

Filed July 2, 1970, Ser. No. 52,048
Int. Cl. B67d 5/30
U.S. Cl. 222—16 5 Claims



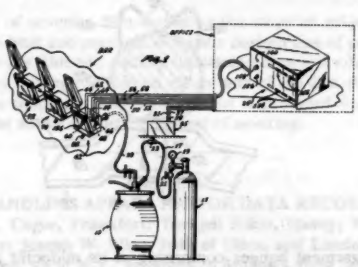
Beverage dispensing apparatus having an adjustable stroke, positive displacement pump unit, coupled to a reservoir which holds an inverted beverage bottle. The pump unit is adaptable to installation in an assembly of several units in rack form, with a single drive motor, each unit being selectively operable. Single or multiple units can be connected to a variety of actuating means and delivery spout or nozzle arrangements, each unit being readily removable for servicing. When actuated, the pump drive mechanism completes a single cycle to drive the selected pump through a preset dispensing and recharging stroke, and is capable of delivering the liquid for a considerable distance to an outlet.

3,666,143

AUTOMATIC FLUID DISPENSING APPARATUS WITH MANUAL OVERRIDE

Murray Weston, Northridge, Calif., assignor to Fred Fisher, Van Nuys, Calif., part interest

Filed June 22, 1970, Ser. No. 48,327
Int. Cl. B67d 1/12
U.S. Cl. 222—61 10 Claims



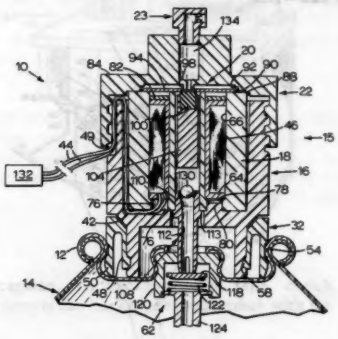
An apparatus for dispensing a predetermined volume of fluid under pressure with provision for modifying the dispensing time of the fluid to compensate for changes in the pressure on the fluid. Further provision is made to selectively dispense one of a plurality of predetermined liquid volumes, and to record the number of dispensing cycles made of each said predetermined liquid volume.

3,666,144

AEROSOL DISPENSING APPARATUS HAVING DISC-SHAPED SOLENOID-ACTUATED PLUNGER

Gary C. Winder, Islington, Ontario, Canada, assignor to Air Guard Control of Canada Limited, Downsview, Ontario, Canada

Filed Dec. 11, 1970, Ser. No. 97,265
Int. Cl. G04c 23/38
U.S. Cl. 222—70 10 Claims



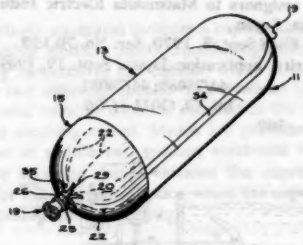
An aerosol dispenser having a housing defining a chamber. The housing is adapted to be attached to an aerosol container to permit spraying liquid to leave the container and enter the chamber. An outlet opening in the top of the chamber leads from a valve seat in the chamber to a spray tip and a seal assembly is normally held in sealing engagement on the seat by pressure in the container. An electromagnetis coupled to the body and is operable to draw a plunger downwardly to move the seal assembly off the valve seat to periodically dispense a predetermined quantity of spraying liquid from the container.

3,666,145

COLLAPSIBLE DISPENSER WITH DISPENSING CAP

Guy Norwood Fisher, Wilmette, Ill., assignor to Kraftco Corporation, New York, N.Y.

Filed Nov. 17, 1969, Ser. No. 877,062
Int. Cl. B65d 35/04
U.S. Cl. 222—107 1 Claim



A package for flowable products is provided, the package comprising generally tube shaped dispenser of flexible plastic material and formed with a dispensing cap secured to the end of the package. The dispensing cap is secured to the exterior of the package adjacent an end closure which may be severed from the package to provide a discharge opening. The dispensing cap has an opening therein but holds the package wall against an uncontrolled expansion or a tear propagation when the package is squeezed to dispense the package contents through the opening formed in the

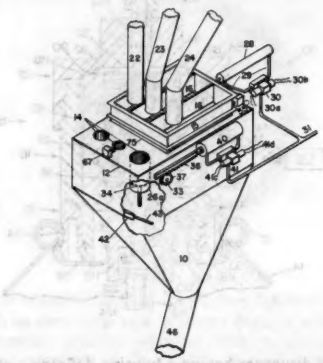
dispensing cap. The stream of dispensed material may be discharged at different rates and, if desired, formed to be fanciful in shape.

3,666,146

MINOR INGREDIENT DISPENSER

Philip W. Robinson, 7831 Seventh St., Downey, Calif.

Filed Jan. 21, 1971, Ser. No. 108,379
Int. Cl. G01f 11/10
U.S. Cl. 222—132 6 Claims



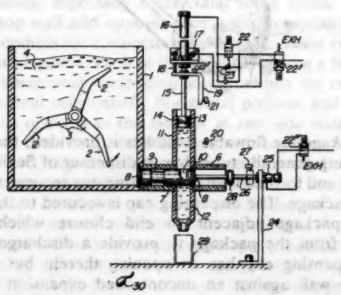
An apparatus is provided for measuring and dispensing materials in particulate form. The apparatus includes a receiver having a sheeted top with openings therein. An open-bottom rack, divided into material storage compartments, is disposed on the sheeted top in spaced relationship to the openings. Means are provided for horizontally moving the rack into and out of alignment with the openings for sequentially discharging particulate material therethrough. Measuring cups, with adjustable volume, are disposed below the openings with their open upper ends substantially level with the top. Means are provided for (a) holding the cups in alignment with the top, (b) inverting the cups to discharge their contents into the receiver, and (c) returning the cups to their upright position. The apparatus includes electrical circuit means for operating the rack and measuring cups in controlled sequence.

3,666,147

APPARATUS FOR FEEDING VISCOUS MATERIALS

Takashi Shiraki, Neyagawa, and Izumi Hino, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sept. 8, 1970, Ser. No. 70,159
Claims priority, application Japan, Sept. 19, 1969, 44/76079; 44/76080; 44/76081
Int. Cl. G01f 11/06
U.S. Cl. 222—309 4 Claims



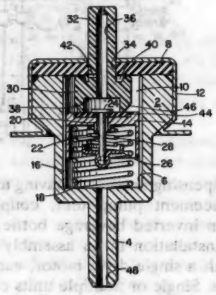
An apparatus for feeding viscous materials, in which a material, e.g. a gel, having a relatively high viscosity is stored in a storage tank with stirring means disposed therein, and feeder means consisting of two piston-cylinder units combined integrally in a cross-shape is connected to the storage tank in communication therewith, said two pistons being slidingly operated within the respective cylinders by driving means, whereby the gel in the storage tank is sucked into one of the cylinders and discharged from one end of the other cylinder.

3,666,148

AEROSOL VALVE WITH SAFETY RELIEF DEVICE

Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Oct. 13, 1969, Ser. No. 865,907
Int. Cl. B65d 83/14
U.S. Cl. 222—396 4 Claims



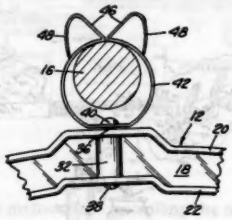
A valve assembly for a pressurized container, the valve assembly facilitating use of the container in the normal manner, but also having facility for automatically relieving excessive pressure in the container.

3,666,149

GARMENT HANGER SUPPORT

John K. Woodhull, 140 East Palm Canyon Drive, Palm Springs, Calif.

Filed July 17, 1970, Ser. No. 55,710
Int. Cl. A47j 51/098
U.S. Cl. 223—85 1 Claim



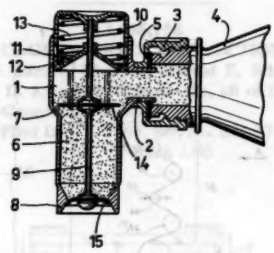
A garment hanger comprising at its midpoint a shoulder bar having a holder consisting of two opposed, spring-pressed parts that cooperate to form a substantially closed loop surrounding the supporting bar. Cam means are provided on the abutting ends of the holder so that when pushed upwardly against the bar from below, the two holder parts are cammed apart to pass on opposite sides of the bar, and then close together above the bar to provide a bearing surface that overlies the top of the bar. A downward pull on the hanger causes the two parts of the holder to open up and slip down off the bar.

3,666,150

ARRANGEMENT FOR DELIVERING PREDETERMINED QUANTITIES OF LIQUID AND SOLID MATERIAL

Sten Liljeholm, Karlskoga, Sweden, assignor to Stelf Konsult, Karlskoya, Sweden

Filed Nov. 5, 1969, Ser. No. 874,337
Claims priority, application Sweden, Nov. 7, 1968, 15078/68
Int. Cl. G01f *11/28*
U.S. Cl. 222—453 2 Claims



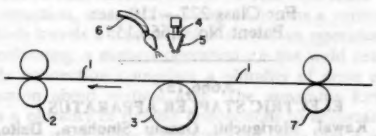
A batching arrangement comprising two valve bodies both of which are closed in an intermediate position and thereby ensure accuracy of the material amount to be batched, in such a manner, that both valve bodies during a certain stroke length are simultaneously in sealing engagement whereafter one of said valves opens.

3,666,151

APPARATUS FOR AND METHOD OF SEVERING FILM

Gerald B. Dyer, and Edwin Szpak, both of Kingston, Ontario, Canada, assignors to Du Pont of Canada, Limited, Montreal, P.Q., Canada

Continuation of application Ser. No. 826,934, May 22, 1969, now abandoned. This application Aug. 18, 1970, Ser. No. 64,794
Int. Cl. B26f *3/02, 3/06*
U.S. Cl. 225—2 6 Claims



Process of severing film including the steps of subjecting the film to heat and pressure along the desired line of parting to weaken the film and cooling the heated area and effecting severing by pulling the film on either side of the line of parting with a snapping action. Apparatus is provided for performing the above described method of severing.

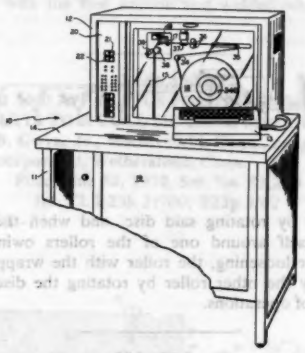
3,666,152

TAPE HANDLING APPARATUS FOR DATA RECORDER

George R. Cogar, Frankfort; Torkjell Sekse, Marcy; Walter Banziger; Joseph W. Ming, both of Utica, and Laszlo Horvath, Ilion, all of N.Y., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Original application Nov. 18, 1968, Ser. No. 786,526, now Patent No. 3,578,257, which is a division of application Ser. No. 541,450, Mar. 30, 1966, now Patent No. 3,483,523. Divided and this application May 5, 1970, Ser. No. 46,570
Int. Cl. B65h *17/20*
U.S. Cl. 226—50 4 Claims

A tape handling apparatus for a machine which records data on magnetic tape wherein the tape is advanced by a drive capstan rotated by a driving belt which also drives a mechanism for backspacing the tape. To advance the tape a pinch roller is moved to engage the tape between itself and



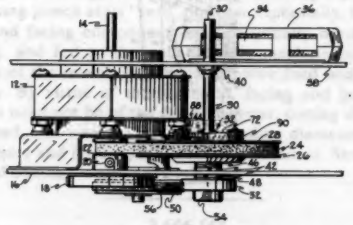
the drive capstan. To backspace the tape, clutch means drivingly connects the backspace mechanism with the driving belt.

3,666,153

TAPE PLAYER WITH FAST TAPE WINDING MECHANISM

Robert Michael Stahl, Indianapolis, Ind., assignor to RCA Corporation

Filed June 26, 1970, Ser. No. 50,273
Int. Cl. B65h *17/22*
U.S. Cl. 226—178 6 Claims



A tape player apparatus includes a capstan utilized to drive a magnetizable medium past a transducing head. A flywheel is rotatably mounted to the capstan which is adapted to be rotated at two different speeds. The flywheel is driven at a first rotational velocity which is coupled to the capstan by a releaseable securing means. Means are provided for driving the capstan at a different, greater, rotational velocity. The releaseable securing means releases the capstan from the flywheel for independent rotation when the capstan is driven at the second rotational velocity.

3,666,154

BROKEN YARN WINDING APPARATUS

Kinyu Ishida, and Yasuhiro Okamura, both of Matsuyamashi, Japan, assignors to Teijin Limited, Umeda, Kita-ku, Osaka, Japan

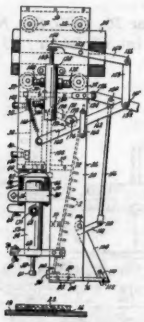
Filed Sept. 15, 1969, Ser. No. 857,728
Claims priority, application Japan, Sept. 18, 1968, 43/67446
Int. Cl. B65h *23/10*
U.S. Cl. 226—195 4 Claims

In winding a great number of filament yarns or tows in position parallel to each other after treatments such as draw-

ing and heat-setting, a rotatable disc having at least two rollers coming in contact with the yarn is disposed between the last roller available for said treatments to the yarn and a take-up apparatus. Said rollers are used interchangeably with

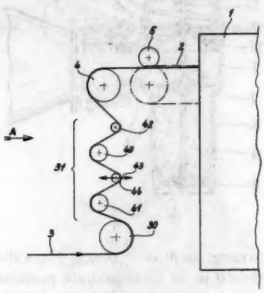
each other by rotating said disc, and when the yarn has wrapped itself around one of the rollers owing to yarn breakage or loosening, the roller with the wrapped yarn is replaced by the other roller by rotating the disc to insure continuity of operations.

3,666,155
GUN FOR PINCH FASTENERS
Frank Saluzzi, 5218 North Flora, Kansas City, Mo.
Filed Aug. 27, 1970, Ser. No. 67,316
Int. Cl. B27f *7/02*
U.S. Cl. 227—110 **10 Claims**



An applicator gun for pinch fasteners of the type resembling a large-headed nail used for securing thick, soft slabs of insulation material to sheet metal, the shank of said fastener being adapted to pierce said insulation slab to abut the underlying sheet metal, and being specially formed to pinch and permanently grip said sheet metal responsively to hammer blows delivered to the head of said fastener, said applicator gun consisting of a carriage movable on a rail above a table supporting said sheet metal and insulation panels, a pneumatic hammer carried by the carriage with its head normally retracted above said panels, a feed mechanism carried by said carriage and operable to deliver fasteners one at a time to said hammer head while in its retracted position, said fastener being retained magnetically on said hammer head, hammer control mechanism carried by said carriage and operable to advance said hammer to cause the shank of said fastener to pierce said insulation and abut said sheet metal, and then to actuate said hammer to deliver hammer blows to the head of said fastener, a single lever operable to control both said feed mechanism and said hammer control mechanism, and an interlock operable to prevent any possible interference between said feed mechanism and said hammer.

3,666,156
APPARATUS FOR OBVIATING LONGITUDINAL RETARDATION OF A TEXTILE
Arno Becker, Stuttgart-Vaihingen, Germany, assignor to Bruckner-Trockentechnik KG, Denzstrasse, Leonberg, Germany
Filed Feb. 18, 1971, Ser. No. 116,483
Claims priority, application Germany, Feb. 18, 1970, P 20 07 359.0
Int. Cl. B65h *23/00*
U.S. Cl. 226—111 **4 Claims**

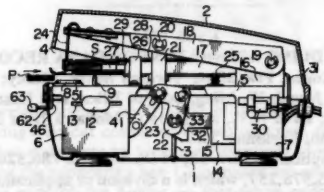


A treatment apparatus comprises a continuously running conveyer for the textile web and also comprises a feed roll which is arranged immediately ahead of the conveyer and which includes at least two separately driven coaxial adjacent roll portions, together with adjustable shrinking apparatus for applying the textile web in folds on the conveyor. At least one traction roll is arranged ahead of the feed roll and includes a corresponding number of separately driven roll portions. The drive at each side of the shrinking apparatus and the drives at the roll portions on the corresponding side of the traction roll and of the feed roll are coupled together to maintain their speeds in a constant ratio.

ERRATUM

For Class 227—110 see:
Patent No. 3,666,155

3,666,157
ELECTRIC STAPLER APPARATUS
Hiroshi Kawai, Moriguchi; Osamu Sinohara, Daito, and Tadayuki Haruyama, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 4, 1970, Ser. No. 60,839
Claims priority, application Japan, Aug. 15, 1969, 44/78765
Int. Cl. B25c *5/02*
U.S. Cl. 227—131 **2 Claims**



An electric stapler apparatus comprising an electromagnet provided on the rear undersurface of a base mount and constituting an operating power source, a staple driving lever adapted to be moved upwardly and downwardly by the electromagnet, the forward end portion thereof fixedly securing a

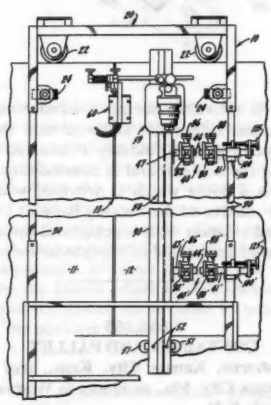
staple driving hammer and the rear end thereof being mounted pivotally on the rear portion of the base mount, a staple guide casing positioned in a floating relationship above the base mount, said casing containing inside of the forward end portion thereof U-shaped staples and pivotally mounted at the rear end thereof on the rear portion of the base mount, and a staple clinching anvil rotatably mounted on the front upper surface of the base mount and provided with a pair of staple clinching grooves for clinching inwardly the staples on the upper surface of a flat anvil portion and another pair of staple clinching grooves for clinching the staples outwardly.

3,666,158

CAGE-TO-TRACK CONNECTION

Lawrence W. Bieker, Munster; Harold E. Schuler, Hobart, and Mark D. Kinghorn, Schererville, all of Ind., assignors to Aerojet-General Corporation

Filed Dec. 3, 1969, Ser. No. 881,777
Int. Cl. B23k *1/00*
U.S. Cl. 228—25 **15 Claims**



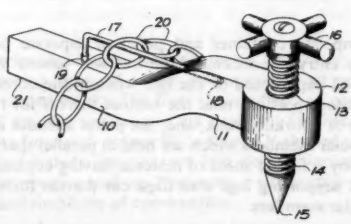
An apparatus for positioning and removing an operational unit about a desired location at a vertical weld seam. A flexible connection, attached to a cage, supports a vertical track on which travels a tractor which carries an operational unit for performing a desired operation on the weld seam. The flexible connection comprises a plurality of arms pivotally connection about vertical axes. The apparatus further includes a plurality of flexible connections to accurately align the vertical track along a vertical weld seam that is not truly vertical and/or is not perpendicular to any horizontal plane.

3,666,159

CLAMPING MEANS FOR PIPES AND FITTINGS

Robert L. Watson, Box 295 RD #2, Lowellville, Ohio

Continuation-in-part of application Ser. No. 648,318, June 23, 1967, now Patent No. 3,467,295, dated Mar. 3, 1969. This application July 15, 1969, Ser. No. 841,954
Int. Cl. B23k *1/14*
U.S. Cl. 228—49 **4 Claims**



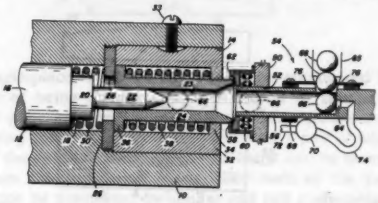
A portable lightweight clamping device for securing two sections of pipe in end to end relation to facilitate welding of the sections to one another. The clamping means includes a plurality of arms which are clamped to one of the sections of pipe and which extend outwardly in spaced relation to the other piece of pipe and are provided with adjustable screws so that the second piece of pipe can be brought into proper alignment with the first section and welded while being so held.

3,666,160

METHOD AND APPARATUS FOR FEEDING DISCRETE PARTS TO A COLD HEADING MACHINE

Childress B. Gwyn, Jr., Wethersfield, Conn., assignor to Contacts, Incorporated, Wethersfield, Conn.

Filed June 30, 1970, Ser. No. 51,290
Int. Cl. B23k *21/00*; B23p *3/02*
U.S. Cl. 228—3 **12 Claims**



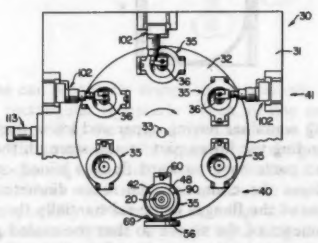
The machine is described with reference to the production of cold bonded composite electrical contacts. A cold heading machine is altered to permit contact facing material to be fed into the coning punch assembly in discrete pieces such as balls, cylinders or the like. Ordinarily, pieces severed from a wire feed are delivered directly to the header die. In the present invention, the coning punch acts as a carrier of this material to the header die. The preferred apparatus is inherently self-timing, loading the contact facing material into the coning punch at its "rest" position. Optionally, individual body and facing components may be initially bonded as by brazing, and fed to the cold heading machine by the apparatus of the invention, eliminating wire feed and severing entirely. By virtue of the invention, facing and body components need not be of the same diameter, coning shapes are optimized, and a larger variety of heading diameters, facing thicknesses and heading ratios may be obtained. Stronger interfacial bonding is also achieved.

3,666,161

METHOD AND APPARATUS FOR WELDING BELLOWS CONSTRUCTIONS AND THE LIKE

Anthony T. Keller, Pequannock, N.J., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 6, 1970, Ser. No. 17,172
Int. Cl. B23k *1/00*
U.S. Cl. 228—12 **12 Claims**



Method and apparatus for welding together the internal diameters of two bellows members wherein the apparatus has a frame means carrying an indexible table having a fixture thereon, the fixture being adapted to receive and hold the

bellows members with the internal diameters thereof in a position for being welded together. The table is indexed to cause the fixture to move from a loading station thereof to a welding station thereof adjacent welding means carried by the frame means. Automatic means causes the welding together of the internal diameters of the bellows members with the welding means while the members are disposed at the welding station.

3,666,162

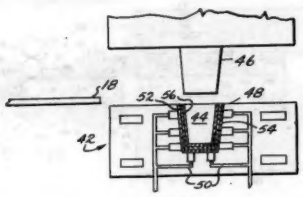
FOAMED POLYMER CUP AND METHOD FOR MAKING SAME

James R. Tiffin, 710 Colgate Lane, Newark, Del., and Earl Erdman, 117 Carlie Rd., Lynnfield, Wilmington, Del.

Continuation of application Ser. No. 261,683, Feb. 28, 1963, now abandoned. This application June 7, 1966, Ser. No. 555,922

Int. Cl. B29c *17/03;* **B29d** *27/00*

U.S. Cl. 229—1.5 B **6 Claims**



An improved polystyrene vending machine cup is made by vacuum forming and deep drawing a sheet consisting of a closed cell foam resin core with a nonporous, smooth tough resin skin on both sides of the core. The sheet is formed by extrusion of a hot sheet of foamable thermoplastic resin and quench chilling the surfaces of the sheet to form the skins on each side of the core. The cup can be held in the hand when filled with material having a temperature of 100° C.

3,666,163

PACKAGING CONTAINER

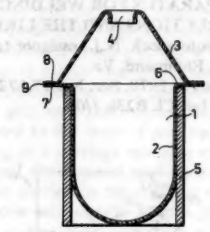
Rolf Lennart Ignell, Lund, Sweden, assignor to Sobrefina SA, Fribourg, Switzerland

Filed Feb. 24, 1970, Ser. No. 13,651

Claims priority, application Sweden, Mar. 20, 1969, 3866/69

Int. Cl. B65d *5/56*

U.S. Cl. 229—14 B **2 Claims**



A packaging container having upper and lower parts and a sleeve surrounding the lower part to add strength thereto in which the two parts have outward flanges joined or sealed together to form the container, the inner diameter of the sealed portions of the flanges being substantially the same as the outer diameter of the sleeve so that the sealed portions when folded down over the top edge of the sleeve form a U-shaped channel for receiving the sleeve.

3,666,164

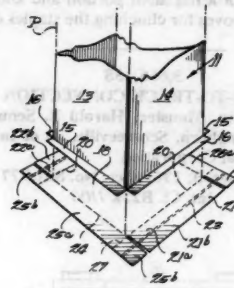
CONTAINER AND COVER THEREFOR

Terrill L. Nederveld, Neffsville, Pa., assignor to Packaging Corporation of America, Evanston, Ill.

Filed July 15, 1970, Ser. No. 55,043

Int. Cl. B65d *13/00*

U.S. Cl. 229—23 R **3 Claims**



A container is provided having a tubular member with foldably connected side walls and one end thereof being delimited by locking flaps foldably connected to the side walls. Overlying the one end and in interlocking engagement with the flaps is a cover which is provided with peripheral panels foldable relative to the locking flaps so that each flap is in sandwiched relation with a peripheral panel, when the cover is assembled on the end of the tubular member.

3,666,165

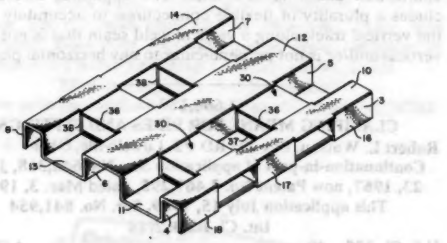
CONTAINER AND PALLET

Edward L. Osborne, Kansas City, Kans., and Franklin J. Wagner, Kansas City, Mo., assignors to Westvaco Corporation, New York, N.Y.

Filed Sept. 23, 1970, Ser. No. 74,740

Int. Cl. B65d *13/00*

U.S. Cl. 229—23 R **6 Claims**



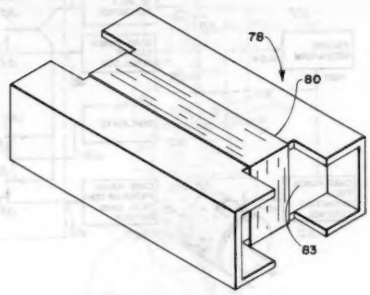
A composite container and pallet or separate pallet for four-way entry constructed from cut and scored blanks of corrugated paperboard or the like wherein the container includes cutout portions near the bottom thereof for receiving the tines of a forklift truck, and, the pallet includes a plurality of tubular members which are held in parallel spaced apart relation by a folded sheet of material having coplanar channels and supporting legs with flaps cut therein for receiving the tubular members.

3,666,166

WRAPPING SET AND PACKAGE FORMED THEREFROM

Anthony Freakes, Leonia, N.J., assignor to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed May 22, 1970, Ser. No. 39,808
Int. Cl. B65d *5/34, 85/70*
U.S. Cl. 229—23 AB 1 Claim



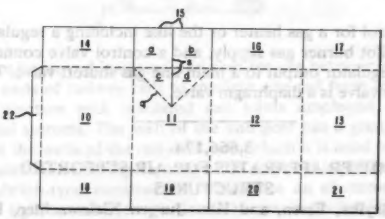
A wrapping set for packaging books or the like, comprising inner and outer panels, each said panel being provided with inner and outer scored lines defining central, side and flap portions when said panels are folded at said lines. The inner panel is folded about the package contents, and the outer panel is then folded about said inner panel in a direction transverse to the following direction of said inner panel, and is adhered to the inner panel. The width of the outer panel exceeds the separation of inner scored lines on the inner panel, whereby the lateral edges of said folded outer panel protrude beyond the folded inner panel to provide a buffer for protecting the package contents.

3,666,167

SHIPPING CASE WITH ACCESS OPENING

James Harry Watts, Hendersonville, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 7, 1970, Ser. No. 95,655
Int. Cl. B65d *5/16*
U.S. Cl. 229—37 R 1 Claim



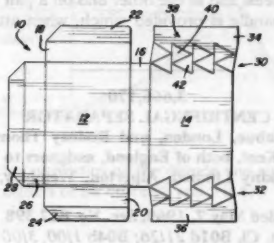
The disclosure is concerned with large, heavy-duty, paperboard shipping cases of a type constructed from one-piece standard slotted blanks. The front closure flap and part of the front wall are slit, and creases are provided for folding portions of the front wall outwardly to form a V-shaped opening. Advantages include easy access into deep shipping cases, sealing the opening and top flaps with a single strip of tape, strength and simplicity of construction.

3,666,168

PAPERBOARD CUSHIONING CELL CONSTRUCTION

James H. Partain, Norcross, Ga., and Richard H. Johnson, Arlington Heights, Ill., assignors to Stone Container Corporation, Chicago, Ill.

Filed June 29, 1970, Ser. No. 50,447
Int. Cl. B65d *85/00*
U.S. Cl. 229—40 29 Claims



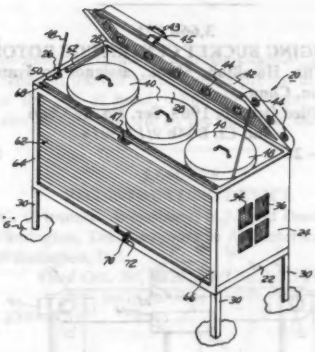
A single-piece blank of paperboard or corrugated board capable of being folded to provide a pair of spaced apart parallel panels. Upon folding, there is realized an end cell cushioning construction connecting at least a pair of adjacent ends of the parallel panels. Also, the blank can be formed so that upon folding, a pair of opposite ends of the parallel panels can be connected by similar end cell cushioning constructions. The cushioning cell construction is suitable for use both in making spacer pads or pallets for use as interior protective devices in shipping containers or for making shipping containers for mailing books or the like.

3,666,169

REFUSE CAN RECEPTACLE

Jordan Eaton, 967 Continental Ave., Detroit, Mich.

Filed May 5, 1971, Ser. No. 140,472
Int. Cl. B65f *1/08*
U.S. Cl. 232—43.2 3 Claims



A refuse can receptacle comprising a normally closed substantially rectangular receptacle which, in one embodiment, may be anchored to the ground by spaced legs. The receptacle is provided with a bottom spaced from the ground and is divided by spacers to accommodate a plurality of refuse cans. The side and rear walls of the receptacle are imperforate except for a plurality of screened openings to dissipate odor. The top of the receptacle is closed by a hinged cover. The side and rear walls of the cover wall are of double walled construction to receive a sliding, flexible, corrugated front

retractable wall when the cover is closed to permit free access to the refuse cans from the front of the receptacle. The front wall is normally retained in closed position by a latch assembly.

In another embodiment, one end wall is provided with an auxilliary receptacle which can be opened from the side and top and which is adapted to receive a plurality of litter bags.

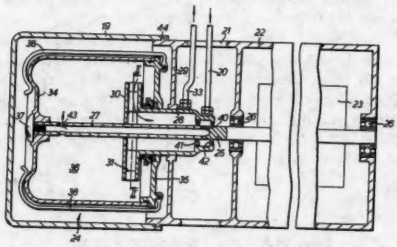
In another embodiment, the improved refuse can receptacle, instead of being anchored to the ground, is supported at one end on wheels and at the other end on a pair of legs, and a removable handle is provided which, when attached, permits moving.

3,666,170

CENTRIFUGAL SEPARATOR

Antonio Cacciabue, London, and Rodney Thomas Beazley, Maidstone, Kent, both of England, assignors to The Glacier Metal Company Limited, Alperton, Wembley, Middlesex, England

Filed May 7, 1969, Ser. No. 822,398
Int. Cl. B01d *21/26;* **B04b** *1/00, 3/00*
U.S. Cl. 233—1 A **5 Claims**



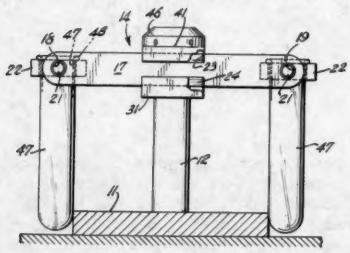
A centrifugal separator which includes a centrifugal pump for pumping the fluid from the separator, the pump being constituted by stationary vanes co-operating with the rotating fluid.

3,666,171

SWINGING BUCKET CENTRIFUGE ROTOR

Charles J. Filz, Hamilton, Mont., assignor to Ivan Sorvall Inc., Newton, Conn.

Filed Oct. 20, 1969, Ser. No. 867,566
Int. Cl. B04b *9/12, 9/14*
U.S. Cl. 233—26 **5 Claims**



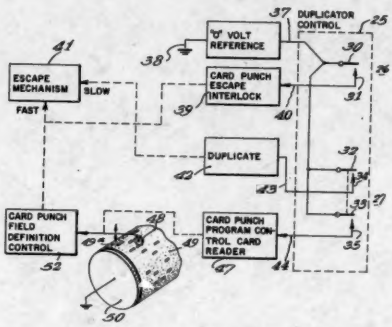
A swinging bucket centrifuge rotor made of separate, modular parts which are releaseably assembled and secured firmly in position by threading engagement between a nut and a central support block.

3,666,172

DUPLICATOR CONTROL FOR CARD PUNCH

Ralph E. Smith, Park Ridge, Ill., assignor to ICM, Inc.

Filed Apr. 23, 1970, Ser. No. 31,194
Int. Cl. G06k *1/16*
U.S. Cl. 234—19 **5 Claims**



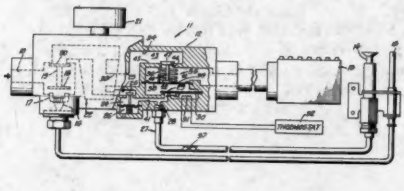
An auxiliary duplicator control for a card punch machine which bypasses the program control of the machine for copying all or a selected portion of the information on a card. The copying may be carried out at normal duplicate speed or at a higher speed used in the card punch machine for field definition indexing.

3,666,173

PILOT REGULATOR OPERATED MAIN VALVE

William A. Ray, North Hollywood, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 21, 1970, Ser. No. 39,282
Int. Cl. F23n *1/00*
U.S. Cl. 236—15 A **3 Claims**



A control for a gas heater or the like including a regulator for the pilot burner gas supply, and a control valve connecting the regulator output to a main line gas shutoff valve. The main line valve is a diaphragm valve.

3,666,174

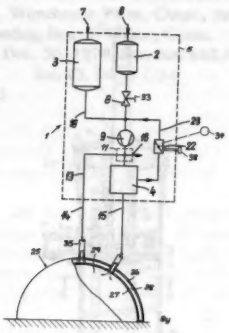
BLOWER APPARATUS FOR AIR-SUPPORTED STRUCTURES

Rudolf Brylka, Essen, and Hans-Jurgen Kleinwachter, Bad Nenndorf, both of Germany, assignors to Kappers Klimatechnik GmbH & Co. KG, Bad Nenndorf and Fried, Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany, part interest to each

Filed Nov. 14, 1969, Ser. No. 876,857
Claims priority, application Germany, Dec. 6, 1968, P 18 13 089.7
Int. Cl. F24h *3/02*
U.S. Cl. 237—2 R **10 Claims**

A blower apparatus has a substantially closed housing formed as a trailer and an air passage through this housing. A

blower in the passage sucks air in through one of two filters, i.e., a normal dust filter or an ABC (atomic, biological, chemical) filter, and expels it into the chamber formed between two walls of a double-walled air-supported structure. Some of the pressurized air is leaked into the housing to maintain this at superatmospheric pressure so that contaminants cannot enter. A heat exchanger is provided in the air stream for air which is used to pressurize the area enclosed by the structure, and a shunt from this exchanger back to the passage upstream of the blower is controlled by a thermostatic valve. The pressure in the chamber is greater than that in the area.

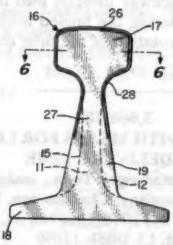


3,666,175

END POST INSULATOR

Homer R. Gill, St. Marys, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 15, 1970, Ser. No. 28,889
Int. Cl. E01b *11/00, 11/32, 26/00*
U.S. Cl. 238—152 **2 Claims**



An improved insulated end post for use between the meeting ends of railway rails to insulate one rail from another in conjunction with insulated rail joints employed in block signal systems. The web of the end post has a greater width than the webs of the rail ends with which it is used to provide greater load-bearing capacity. The end post is preferably of a sandwich-type construction which has an elastomeric core and rigid metal face sheets. The core is preferably formed from a polyurethane compound.

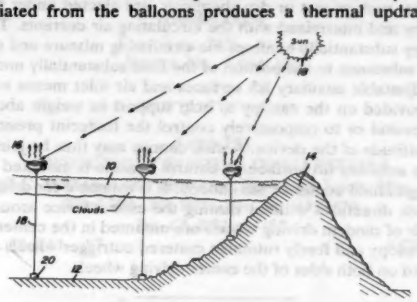
3,666,176

SOLAR TEMPERATURE INVERSION DEVICE

Samuel R. Carter, Jr., 10601 Menoul N.E., Albuquerque, N. Mex.

Filed Mar. 3, 1970, Ser. No. 15,980
Int. Cl. E01h *13/00*
U.S. Cl. 239—2 R **13 Claims**

A cloud cover trapping air pollutants over an affected region is dispersed by anchored balloons positioned closely above the cloud cover adjacent to the cloud trap. Heat radiated from the balloons produces a thermal updraft to change the characteristics of the clouds and subject them to the dispersal effects of air currents and wind.

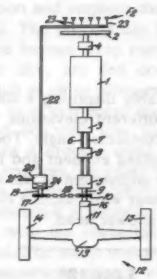


3,666,177

SELF PROPELLED, FAN-TYPE ORCHARD SPRAYER

Samuel Alfred Mencacci, Antwerp, Belgium, assignor to International Machinery Corporation, S.A., St. Niklaas-Waas, Belgium

Filed Apr. 9, 1970, Ser. No. 27,017
Claims priority, application Belgium, Feb. 25, 1970, 49,936
Int. Cl. A01n *17/08*
U.S. Cl. 239—77 **5 Claims**



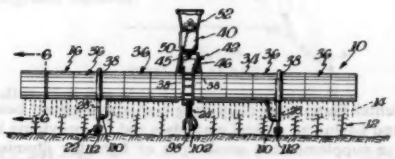
The invention pertains to a single-engined, self propelled sprayer wherein the fan speed can be pre-set at the optimum value for the job at hand, while the ground speed of the sprayer can be varied at will by the operator, during spraying.

3,666,178

FIELD-TREATING DEVICE

Arthur G. Crimmins, Woodbury, N.J., and Donald B. Doolittle, Wilmington, Del., assignors to All American Industries, Inc., Wilmington, Del.

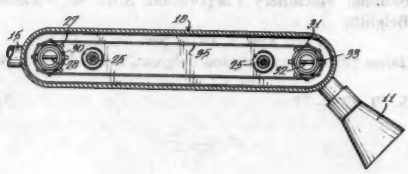
Filed Oct. 30, 1970, Ser. No. 85,529
Int. Cl. A01n *17/08*
U.S. Cl. 239—77 **26 Claims**



An elongated canopy approximately 50 feet long and about 10 feet wide is driven widthwise over a field on wheels of adjustable height. Air circulating fans are mounted under the canopy along its longitudinal axis pointing in the

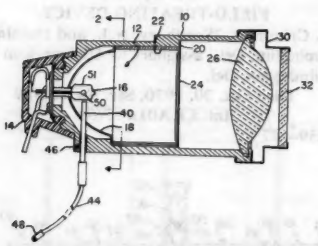
direction of movement of the canopy. Crop-treating substances, such as wet or dry chemicals, are ejected under the canopy and intermixed with the circulating air currents. The canopy substantially confines the circulating mixture and applied substance to the portion of the field substantially under it. Adjustable auxiliary lift surfaces and air inlet means may be provided on the canopy to help support its weight above the ground or to responsively control the footprint pressure and attitude of the device. A dual canopy may thus be joined by an auxiliary lift surface. A control console is mounted on a longitudinal center of the canopy. It is rotatable for driving in both directions without turning the entire device around. A pair of tandem driving wheels are mounted in the center of the canopy and freely rotatable castered outrigger wheels are spaced on both sides of the center driving wheels.

3,666,179
ADJUSTABLE SHOWER APPARATUS
Andreas D. Peschcke-Koedt, Box 134, Moose, Wyo.
Filed Sept. 28, 1970, Ser. No. 75,952
Int. Cl. B05b *15/08*
U.S. Cl. 239—587 **12 Claims**



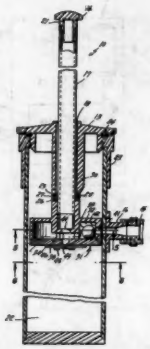
Apparatus for adjustably disposing a shower head at any one of a plurality of different elevations while maintaining the shower head at a preselected angle. The mounting means includes a hollow elongated element and housing means for effecting the automatic adjustment of the shower head angle and for conducting shower water from a base member of the mounting means to the shower head.

3,666,180
DENTAL LIGHT
Peter M. Coombs, Newton, N.H., and Harold L. Hough, Beverly, Mass., assignors to Sylvania Electric Products, Inc.
Filed Sept. 2, 1970, Ser. No. 68,847
Int. Cl. A61b *1/06;* **F21v** *13/04*
U.S. Cl. 240—41.15 **6 Claims**



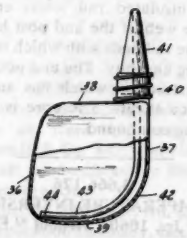
A dental illuminator projecting a sharply defined beam of light and having an optical clad glass rod for providing in addition a supplementary small spot of light for illuminating cavities and the like. The glass rod is placed with one end near and facing said bulb and perpendicular to the axis of the filament to receive light directly therefrom. The rod extends outside said fixture, and is connected to a flexible fiber optic conduit.

3,666,181
SPRINKLER HEAD APPARATUS
Mark Healy, Orange County, Fla., assignor to Senninger Irrigation, Inc., Orlando, Fla.
Filed Apr. 2, 1971, Ser. No. 130,653
Int. Cl. B05b *3/00*
U.S. Cl. 239—206 **10 Claims**



A sprinkler head apparatus is provided having a casing adapted to be connected to a water line in which the casing has a tube passing through the top thereof with a nozzle on the end exterior to the casing and a raceway attached to the other end of the tube inside the casing. The raceway has a ball located therein adapted to ride in a generally circular path and a protrusion connected thereto whereby intermittent collision with the ball riding in the raceway will rotate the raceway along with the tube and nozzle of the sprinkler head. The raceway has an inlet for water to enter at an angle generally tangential to the raceway for driving the ball in the raceway. The water entering the raceway may then pass into the tube and out the nozzle of the sprinkler head. The raceway has a second variable water inlet through which water may enter the raceway directly into the tube thereby varying the amount entering the angled inlet for driving the ball so that the rate of rotation of the tube and nozzle can be varied as desired.

3,666,182
SQUEEZE BOTTLE WITH MEANS FOR LOCATING END OF DELIVERY TUBE
Glen L. Cureton, Chattanooga, Tenn., assignor to Chattem Drug & Chemical Company, Chattanooga, Tenn.
Filed Apr. 24, 1970, Ser. No. 31,580
Int. Cl. B05b *11/00*
U.S. Cl. 239—327 **1 Claim**



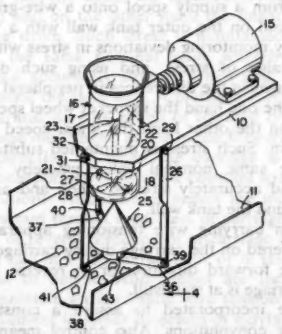
A squeeze bottle particularly useful for emitting a horizontal spray, the bottle being composed of a flexible plastic material and having a dispensing nozzle located in an off-center position adjacent one corner of the bottle enclosure, with a flexible delivery tube extending from the nozzle into

the enclosure. Means are provided in the enclosure itself which guide the end of the delivery tube upon insertion into the enclosure to a position which is diagonally opposite to the corner of the enclosure in which the nozzle is located.

3,666,183
WIDE ANGLE SOLID CONE SPRAY NOZZLE CAPABLE OF HANDLING SLURRY FLOW
Donald A. Smith, Warehouse Point, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Dec. 30, 1970, Ser. No. 102,642
Int. Cl. B05b *1/34*
U.S. Cl. 239—463 **1 Claim**

A wide angle solid cone spray nozzle capable of handling flurry flow. Slurry is introduced into the nozzle tangentially at the inlet end to give the flow a spinning effect. A baffle in the nozzle increases the spinning effect. The slurry is discharged through a venturi having a flaring bell mouth outlet.

3,666,184
SPREADING DEVICE
Ray V. Beshgetoor, Merchantville, N.J., assignor to Be-Mo Machine Co., Kalamazoo, Mich.
Filed Oct. 15, 1970, Ser. No. 44,778
Int. Cl. B05b *1/26*
U.S. Cl. 239—512 **6 Claims**

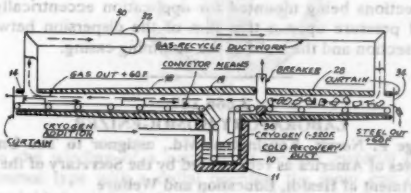


A device for spreading gravitationally falling particulate material wherein support means is located in the path of the falling material, a rotary drive member upstands from the support means, and an upwardly tapering distribution member is removably engaged in driven relation on the drive member for gravitationally receiving falling material and centrifugally impelling the material.

ERRATUM

For Class 240—41 see:
Patent No. 3,666,180

3,666,185
CRYOGENIC CRUSHING OF MATERIALS
Virgil C. Williams, 103 Frontenac Forest, St. Louis, Mo.
Filed Feb. 17, 1971, Ser. No. 115,976
Int. Cl. B02c *21/00*
U.S. Cl. 241—17 **4 Claims**

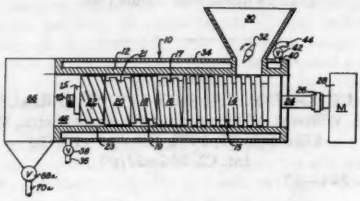


A cryogenic process for disintegrating materials such as metals, plastics, rubber, foodstuffs; wastes such as scrap iron, garbage, etc. The process is employed for materials which have decreased impact resistance upon refrigeration to low temperatures and recovers the refrigeration from the material after disintegration and employs this refrigeration in cooling of the material. The process can be employed in a continuous form where ferrous scrap material, such as junk automobiles, or the like, are fed countercurrently with a refrigerant fluid such as air or nitrogen in a pre-cooling stage and subsequently to a cryogenic cooling stage where the material is cooled to very low temperatures, and subsequently broken in a process using hammers, mechanical shredders, rotary crushers, or other physical forms. In the continuous process, in the post-cooling stage after breaking, the disintegrated material is passed in countercurrent heat exchange relation with the refrigerant fluid to recover the cold in the material. The scrap material in this stage may be separated by a magnetic separator which separates ferrous material from copper, aluminum and other materials, such as organic scrap in the form of fibers or the like, or separation may be effected on screens or in air or hydraulic elutriators or in cyclone separators. The refrigerant fluid may be used in a closed system, passing from the post-cooling stage to the cryogenic cooling stage where additional cryogenic refrigerant fluid may be added and into the pre-cooling stage and back to the process. In a preferred embodiment the refrigerant fluid, after passing through the pre-cooling stage, may be in part compressed to a high pressure and then expanded to a very low temperature in a turbine expander where the cooled refrigerant is used directly in the cryogenic cooling stage. The remainder of the refrigerant fluid, after the pre-cooling stage, that is not passed through the high pressure stage, may be recycled back to the post-cooling stage, where it is used to abstract refrigeration from the cold, disintegrated material.

3,666,186
THIN FILM MILL
Carroll B. Hoffman, P.O. Box 987, Newburgh, N.Y.
Filed July 20, 1970, Ser. No. 56,430
Int. Cl. B02c *7/06*
U.S. Cl. 241—45 **21 Claims**

A thin film mill for simultaneous reduction in size as by separation of agglomerates of particle clusters and dispersion of the fine particles in a liquid carrier, constructed of a plurality of rotatable cylindrical sections arranged in a row, each

section having a helical groove cut in its cylindrical surface, the grooves being variable in depth becoming shallower and wider with progressively increasing pitch from inlet to outlet,



the sections being mounted for application eccentrically of radial pressure upon a thin film of the dispersion between each section and the walls of the confining casing.

3,666,187

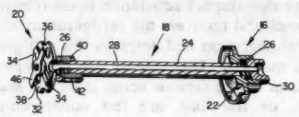
LABORATORY HOMOGENIZER

George F. Norris, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Filed May 13, 1970, Ser. No. 36,758

Int. Cl. B02c *13/18*

U.S. Cl. 241—90 **6 Claims**



An homogenizer for laboratory usage for the grinding and homogenizing of animal bone, gristle, cartilage, fur and the like including a container and a cutting unit operable through the container cover. The grinding and homogenizing is accomplished by means of the cutting unit which includes three series of blades, the first being a stationary plate blade having obliquely directed holes passing therethrough, the second being a rotary cutting blade which slides against the plate blade, and the third being an axially disposed second rotary blade which assists in both cutting and pumping.

3,666,188

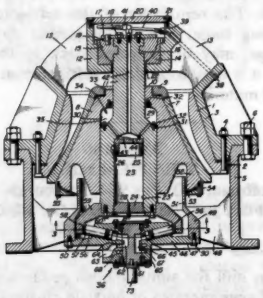
GYRATORY CRUSHER

Arthur W. Lippmann, Poway, Calif., assignor to Hewitt-Robins Incorporated, Stamford, Conn.

Filed Aug. 19, 1969, Ser. No. 851,283

Int. Cl. B02c *2/06*

U.S. Cl. 241—213 **2 Claims**



The present application discloses a gyratory crusher which is actuated by a fluid motor and, more particularly, by a fluid motor having a plurality of sequentially actuated pistons which are positioned radially about the central shaft supporting the movable crushing member and which operate directly on the shaft in order to create the necessary gyratory motion. In addition, a fluid bearing is provided intermediate the movable crushing member and the supporting shaft and which bearing is specifically designed to adjust the vertical position of the movable crushing member within the crushing chamber. The operating mechanism for the movable crushing member is also designed to provide automatic relief in the event uncrushable material in the crushing chamber might create excessive or damaging stresses.

3,666,189

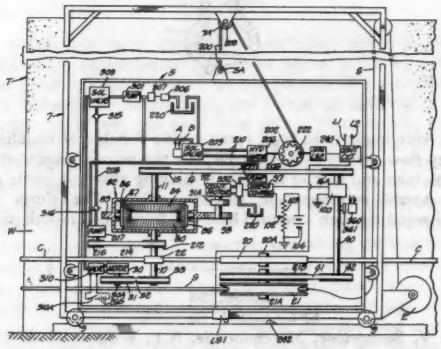
MEANS AND TECHNIQUES USEFUL IN PRESTRESSING CONCRETE STRUCTURES

Maximiliaan J. Dykmans, 4434 Mayapan Drive, La Mesa, Calif.

Continuation-in-part of application Ser. No. 718,138, Apr. 2, 1968, now Patent No. 3,572,596. This application June 24, 1970, Ser. No. 49,277. The portion of the term of the patent subsequent to Mar. 30, 1988, has been disclaimed.

Int. Cl. B21f *17/00;* **B65h** *81/00*

U.S. Cl. 242—7.21 **25 Claims**



In wrapping wire around a concrete tank to prestress the same, a carriage is caused to travel around the tank by a motor-driven sprocket wheel thereon engaging a chain which extends tightly around and on the tank. Simultaneously the wire is fed from a supply spool onto a wire-gripping drum and is then laid on the outer tank wall with a wire tension established by monitoring deviations in stress with respect to a nominal value of stress, and using such deviations to produce changes in the differences in peripheral linear speed between on the one hand the sprocket wheel speed (carriage speed) and on the other hand the linear speed of the wire-gripping drum. Such stress is maintained substantially constant at the same nominal value whereby the wire is uniformly and accurately stressed when and as it is being wrapped around the tank wall.

A platform carrying wire tensioning apparatus may be raised or lowered on the carriage during carriage movement, either in the forward direction or in reverse direction or when the carriage is at standstill.

Means are incorporated to assure a constant spacing between wire convolutions. Also control means are incorporated to maintain constant tension regardless of carriage speed either in a forward or reverse direction or at carriage standstill. The wire may be laid in a continuous helix or in steps accurately controlled as to height. Also means are incorporated to achieve or maintain an automatic wire tension regardless of carriage movement in either direction of carriage movement or at standstill. Further, the wire may be tensioned from a slack or zero tension condition to any desired tension and maintained automatically at such tension without requiring carriage movement. Also, the desired tension may

be preadjusted to any desired value while the carriage is in motion either in the forward or reverse direction. A hydraulic-electrical system is used for these purposes.

3,666,190

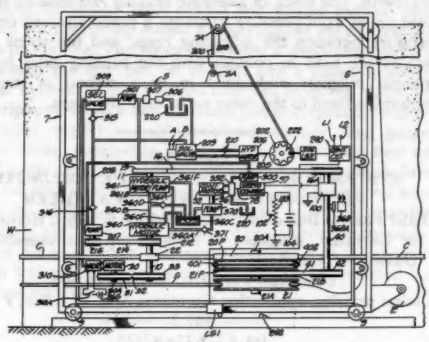
MEANS AND TECHNIQUES USEFUL IN PRESTRESSING CONCRETE STRUCTURES

Maximiliaan J. Dykmans, 4434 Mayopan Drive, La Mesa, Calif.

Continuation-in-part of application Ser. No. 718,138, Apr. 2, 1968, now Patent No. 3,572,596, dated Mar. 30, 1971, and a continuation-in-part of 49,277, June 24, 1970. This application July 16, 1970, Ser. No. 55,335. The portion of the term of the patent subsequent to Mar. 30, 1988, has been disclaimed.

Int. Cl. B21f *17/00*

U.S. Cl. 242—7.21 **6 Claims**



In wrapping wire around a concrete tank to prestress the same, a carriage is caused to travel around the tank by a motor-driven sprocket wheel thereon engaging a chain which extends tightly around and on the tank. Simultaneously the wire is fed from a supply spool onto a wire-gripping drum and is then laid on the outer tank wall with a wire tension established by monitoring deviations in stress with respect to a nominal value of stress, and using such deviations to produce changes in the differences in peripheral linear speed between, on the one hand, the sprocket wheel speed (carriage speed) and on the other hand the linear speed of the wire-gripping drum. Such stress is maintained substantially constant at the same nominal value whereby the wire is uniformly and accurately stressed when and as it is being wrapped around the tank wall. A platform carrying wire tensioning apparatus may be raised or lowered on the carriage during carriage movement, either in the forward direction or in reverse direction or when the carriage is at standstill. Means are incorporated to assure a constant spacing between wire convolutions. Also control means are incorporated to maintain constant tension regardless of carriage speed either in a forward or reverse direction or at carriage standstill. The wire may be laid in a continuous helix or in steps accurately controlled as to height. Also means are incorporated to achieve or maintain an automatic wire tension regardless of carriage movement in either direction of carriage movement or at standstill. Further, the wire may be tensioned from a slack or zero tension condition to any desired tension and maintained automatically at such tension without requiring carriage movement. Also, the desired tension may be preadjusted to any desired value while the carriage is in motion either in the forward or reverse direction. A hydraulic-electrical system is used for these purposes involving a hydraulic motor which drives the carriage connected in a unique manner with respect to a hydraulic motor/pump having its shaft connected to wire-gripping means.

3,666,191

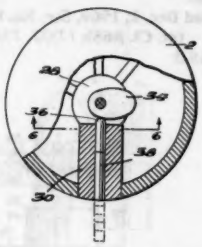
AUTOMATIC TUBE EXTRACTOR

Donald J. Hopko, Yonkers, N.Y., assignor to Windings, Inc., Yonkers, N.Y.

Filed Sept. 1, 1970, Ser. No. 68,664

Int. Cl. B65h *54/00*

U.S. Cl. 242—18 R **1 Claim**



In the winding of a package of flexible material of the universal type with a radial opening, the inner end of the material being led out through the radial opening for twistless payout, in order to make the inner end available when the package is completed and at the same time to provide the radial hole with a guide tube, a rotary switch is connected to a retracting oscillating guide for flexible material which rests on the face of the material being wound and controls a motor mounted inside the mandrel on which the flexible material is being wound. This motor through a cam and follower advances a guide tube, through which the inner end of the material has been threaded, through the radial hole which is formed during the winding at substantially the same rate that the package builds up.

3,666,192

CARTRIDGE FOR ENDLESS TAPE

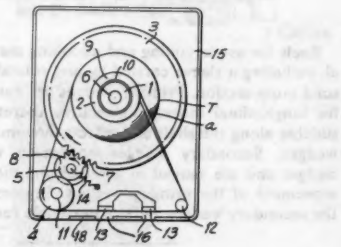
Fukuzo Ito, Yokohama-shi, and Masaoki Sekine, Kawasaki-shi, both of Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki, Kaisha, Tokyo-to, Japan

Filed Sept. 15, 1969, Ser. No. 857,980

Claims priority, application Japan, Sept. 16, 1968, 43/66756

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 A **6 Claims**



This invention relates to an endless tape cartridge having a hub on which a looped endless tape is wound up in a convoluted manner. The tape is pulled out from the innermost convolution of the tape wound on the hub to be rewound on the outermost periphery of the wound tape through a pinch roller, etc. The above mentioned hub for taking up the tape is of double construction consisting of a driving wheel and a driven wheel incorporated with the driving wheel. A revolving plate is installed on the bottom of the driving to receive the tape. The revolving plate is equipped with a revolution

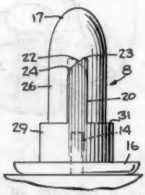
transmission unit through which the revolving plate is operatingly connected to the pinch roller.

3,666,193

TAPE REEL DRIVE TURNTABLE

Charles K. Wellington, Westford; Dietrich Jung, Belmont, and George A. Kwasniewski, Wellesley, all of Mass., assignors to Viatron Computer Systems Corporation, Bedford, Mass.

Filed Dec. 2, 1969, Ser. No. 881,406
Int. Cl. B65h *17/02, 75/00*
U.S. Cl. 242—68.3 **3 Claims**



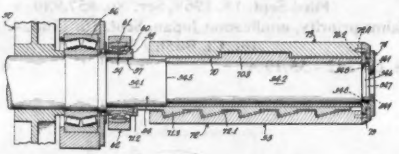
An improved turntable for holding and driving reels of magnetic recording tape and other tapes and particularly for such tapes when supplied in sealed magazines which include cooperating supply and take-up spools. The turntable is preferably formed of a single piece of material and includes reel engaging bars having curved centering surfaces at their ends so that the magazine with its spools may be pressed onto the turntable without regard to the particular reel position. This facilitates the insertion of the magazine onto a recording or playback device and provides a drive turntable without backlash and tape flutter.

3,666,194

REELS FOR STRIP MATERIAL

Walter H. Gosnell, 741 West St., Niles, Ohio

Filed July 17, 1970, Ser. No. 55,907
Int. Cl. B65h *75/24*
U.S. Cl. 242—72 **15 Claims**



Reels for use in coiling and uncoiling metallic strip material, including a sleeve carried by and rotatable with a shaft of solid cross-section. Primary wedges are carried by the sleeve for longitudinal movement relative thereto, and a yoke is slidable along the shaft and effects movement of the primary wedges. Secondary wedges cooperate with the primary wedges and are moved in a radial direction by longitudinal movement of the primary wedges. Segments are carried by the secondary wedges and are moveable radially thereby.

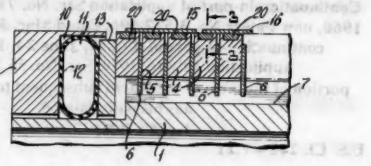
3,666,195

BRAKING DEVICE FOR USE IN WINDING MULTIPLE STRIPS UPON A COMMON MANDREL

Jean Gaudin, Montigny les Cormeilles, France, assignor to Societe De Constructions Mecaniques De Creil

Filed Sept. 9, 1969, Ser. No. 856,928
Claims priority, application France, Jan. 23, 1969, 6901164. The portion of the term of the patent subsequent to Sept. 23, 1986, has been disclaimed.
Int. Cl. B65h *23/10, 77/00*
U.S. Cl. 242—75.2 **3 Claims**

In winding multiple strips of magnetic material, the strips, in passing on their way to a common winding mandrel, are applied to engage an arc-shaped area of the cylindrical surface formed by the outer edge surfaces of a plurality of juxtaposed braking rings rotatively mounted upon a stationary drum. The rings are spaced by intervening spacing rings being of lesser diameter and mounted upon the drum to move freely axially but locked against relative rotation therewith. The stack of alternate braking and spacing rings is held under axial pressure to create a predetermined resilient pressure between the adjoining rings, and the strips to be wound are held in contact with the braking rings by permanent magnets embedded in or a ribbon of magnetic material affixed to the outer surfaces of the rings.

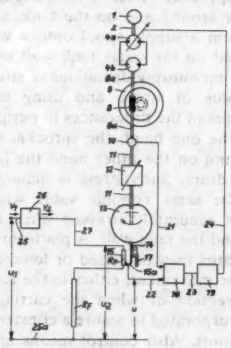


3,666,196

SYSTEM FOR CONTROLLING THE COILING OF ELONGATED MATERIAL ON A COILER

Detlef Fullers, Dusseldorf, and Friedrich Schubel, Herne, both of Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed Apr. 17, 1970, Ser. No. 29,505
Claims priority, application Germany, Apr. 18, 1969, P 19 19 687.3
Int. Cl. B21c *47/28*
U.S. Cl. 242—78 **10 Claims**



A control system is provided for controlling the speed of a rotation of a coiler, such as a drum, in accordance with the rate at which the material is supplied and the diameter of the turn of the coil being layed at that instant. The material is usually layed first in a spiral of increasing diameter and then in an adjacent spiral of decreasing diameter, so that the speed of rotation of the coiler has to be continuously varied. A first signal is provided as a measure of the actual speed of rotation of the coiler, and a second signal, produced by a potentiometer having a sliding contact controlled by cam means driven in a predetermined relationship with the coiler, is provided as a measure of the required speed of rotation. A regulator compares the signals and controls the speed of the coiler accordingly.

3,666,197

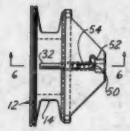
DEPTH GAUGING MEANS FOR FISHING REELS

Chester L. Coshow, P.O. Box 149, Collinsville, Okla.

Continuation-in-part of application Ser. No. 822,463, May 7, 1969, now Patent No. 3,563,489. This application Apr. 20, 1970, Ser. No. 29,809

Int. Cl. A01k *89/00*

U.S. Cl. 242—84.1 R 7 Claims



A spool for fishing reels having line wound thereon and provided with metering means for paying-out predetermined lengths of the line. The spool comprises a peripheral surface upon which the line can be wound, and a gauge member movable between a first position removed from the region of said peripheral surface and a second position spacedly superposed with respect to said peripheral surface, said gauge member being removably retainable in either said first or second position whereby when in said second position line wound on the spool will be spaced above the peripheral surface in the region of said gauge member and supported by the latter in said region, the length of line subsequently payable from the spool when said gauge member is in the second position being limited to those line windings supported by said gauge member.

3,666,198

SEAT BELT REEL

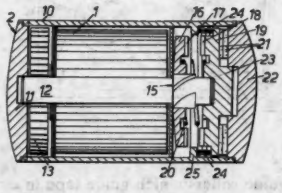
Bernhard Neumann, Bauscheim, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed June 29, 1970, Ser. No. 50,565

Claims priority, application Germany, July 12, 1969, P 19 35 539.6

Int. Cl. A62b *35/00*

U.S. Cl. 242—107.4 4 Claims



This invention relates to safety belts for use in vehicles to retain passengers in their seats in the event of rapid acceleration or deceleration of the vehicle. This application discloses a seat belt of the inertia reel type which allows the passenger restrained by the belt to make relatively slow movements to extend the belt from the reel but which locks the belt against further movement in the event of rapid changes in motion of the vehicle, an inertia reel seat belt according to the invention being provided with an extra safety feature in the form of an energy-absorbing device which is capable of absorbing energy from the seat belt when the force exerted on the seat belt exceeds a predetermined amount.

3,666,199

WIRE BRAKE

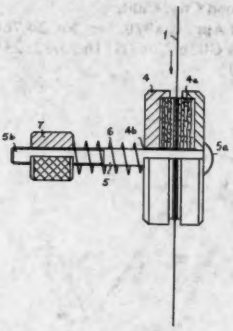
Eliseo Mezzadri, Zurich, Switzerland, assignor to Micafil A.-G., Zurich, Switzerland

Filed Dec. 14, 1970, Ser. No. 97,951

Claims priority, application Germany, Dec. 19, 1969, P 19 63 752.6

Int. Cl. B65h *59/22*

U.S. Cl. 242—149 3 Claims



A device for braking a traveling wire in order to apply a drag force to the wire is constituted by a pair of juxtaposed brake members between which the wire is passed. Each brake member is constituted by a pad of glass fabric adapted to press against the wire, and each glass fabric pad is adhered to an underlying relatively soft supporting base such as felt.

Each brake member is seated in a correspondingly configured recess in a rigid support member, and the two support members are mounted on a support bolt which passes through central openings provided therein and in the brake members. A compression spring adjusted by a nut on the bolt is used to apply an adjustable axial pressure against the two support members urging them towards each other which causes the glass fabric pads to be pressed against the wire.

3,666,200

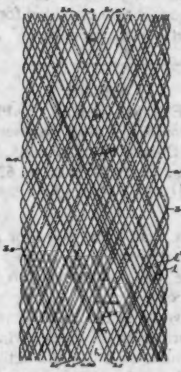
PACKAGE OF FLEXIBLE MATERIAL FOR TWISTLESS PAYOUT AND METHOD OF MAKING SUCH PACKAGE

James W. Newman, Scarsdale; Nicholas M. Bavaro, Mount Vernon, and William A. Wagner, Bronxville, all of N.Y., assignors to Windings, Inc., Yonkers, N.Y.

Filed Sept. 21, 1970, Ser. No. 73,802

Int. Cl. B65h *55/02*

U.S. Cl. 242—163 5 Claims



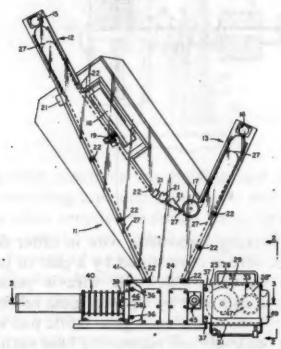
A package of material wound in a universal wind with crossovers in successive layers progressing in opposite

directions around the axis of the package through angles of less than 360° so as to leave a radial opening into the central core through which the free end of the material may be drawn out for payout has the coils in alternate layers spaced apart two to three times as far as those in the adjacent layers.

3,666,201
CASSETTE FEEDING APPARATUS

Alfred F. Stahler, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 1, 1970, Ser. No. 24,760
Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*
U.S. Cl. 242—180 **8 Claims**



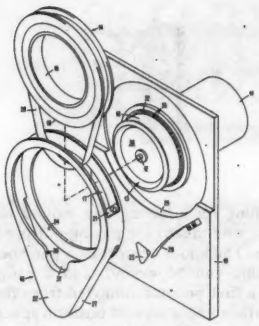
For use with a magnetic tape transport of the type in which a pair of vacuum tape loop storage columns are arranged on either side of a vacuum tape metering capstan and transducing means, and tape is drawn into the storage columns and against the capstan and transducing means from a magnetic tape cassette, an array of cassettes is arranged for movement parallel to the tape pack axes thereof for delivery of any selected cassette to an insertion-withdrawal means that then moves the selected cassette in a plane normal to the tape pack axes and into operative relationship with the tape transport. Means are provided to cause the cassette to engage a precision positioning wall on the transport, and extension means are arranged to extend for centering and driving the tape pack hubs of the cassette. The hubs are formed with springloaded portions engageable with the cassette side walls for braking the hubs when the cassette is not in operating relation with the transport, and the extension means also engages and releases these braking portions to free the hubs for operation. A cover door is provided for the transport and a reel-to-reel arrangement is also provided for operation with a suitable dummy cassette in the transport.

3,666,202
SINGLE REEL MAGNETIC TAPE UNIT

John W. Wenner, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,350
Int. Cl. G11b *15/32, 15/58, 23/10*
U.S. Cl. 242—182 **12 Claims**

A standard 9-track, half-inch, 300-foot mini-reel of magnetic tape, having a relatively large endless polyethylene belt loosely encircling the tape, is inserted into a cartridge have a U-shaped vacuum column portion. The side walls of the vacuum column converge as they extend away from the reel, and an opening is formed in the back surface of the vacuum column. The reel mounts on a vacuum activated reel latch to accurately position the reel and loosely position the cartridge adjacent to reference plate. When the reel is so positioned, the open back of the vacuum column is held against the reference plate by the vacuum opening in the reference plate. A vacuum source both actuates the reel latch, to couple the tape reel to a reversible drive motor, and pulls the endless belt into the vacuum column. Forward rotation of the motor causes a fundamental band of magnetic tape, of increasing layer thickness, to be established in the vacuum column, the inner surface of the endless belt establishing the outer layer of the fundamental band. A magnetic transducer

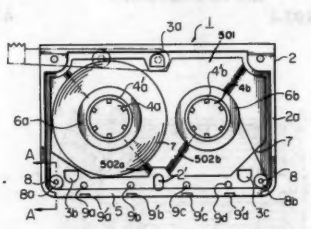


is mounted on the reference plate in a position to contact with the inner layer of the fundamental band. A spring provides a light contact force to oppose the frictional force between the cartridge, and the reference plate and to cause slight rotation of the cartridge about the reel axis when a rewind mode is initiated, to allow high speed rewind with the tape out of contact with the transducer.

3,666,203
TAPE CASSETTE

Masaaki Sato, and Shoichi Saito, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1970, Ser. No. 28,753
Claims priority, application Japan, Apr. 18, 1969, 44/34990
Int. Cl. B65h *59/38;* **G03b** *1/04;* **G11b** *15/32*
U.S. Cl. 242—188 **16 Claims**



The two guide rollers which guide tape in a cassette along the narrow, apertured front wall of its casing are of conductive material and conductively connected with contacts accessible from outside the cassette. When the cassette is installed on a recorder, the contacts are engaged by corresponding contact elements in the control circuit of the recorder. A conductive coating on each end of the tape in the cassette is long enough to bridge the distance between the two guide rollers and thereby to close a circuit in the recorder which arrests the drive in the recorder for the tape reels in the cassette. Each tape end is secured to a reel in the cassette by means of a locking plate releasably engaging a circumferential recess in the drum portion of the reel, the film end being clamped between the plate and the body of the drum portion. Friction between the reels and the top and/or bottom plates of the cassette is reduced by a creased

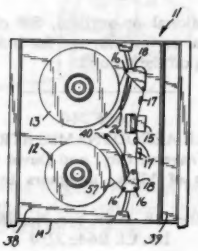
liner sheet whose crease forms a straight narrow ridge radial relative to the reel axis and resiliently engaging the reel. The recorded material may be indicated on a sheet of paper, plastic, or metal releasably retained on an outer surface of the top or bottom wall.

3,666,204

MAGNETIC TAPE TRANSPORT

Walter Gysling, Excelsior, Minn., assignor to Data Action Corporation, Minneapolis, Minn.

Filed Dec. 7, 1970, Ser. No. 95,545
Int. Cl. B65h *59/38*; G03b *1/04*; B65h *63/02*
U.S. Cl. 242—189 14 Claims



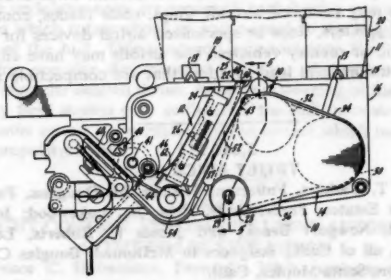
A high speed tape transport in which a pair of rotatably mounted tension arms move into engagement with information bearing tape as it passes between an electromagnetic tape head and, first and second tape reels to form tension loops and thereby maintain constant tape tension. The position of the tension arms is controlled by an actuating element which is connected to each of the arms and is reversibly movable along a line equidistant between the two tape reels. The tension arms are initially positioned outside the normal tape path in order to simplify the tape threading process and rotate inwardly through the path to form the tension loops. A beginning and end of tape sensor mounted adjacent the electromagnetic tape head is movable toward and away from the tape head as a function of tension arm position also for the purpose of simplifying tape threading process.

3,666,205

APPARATUS FOR STRIPPING AND FEEDING WEB MATERIAL FROM A SUPPLY ROLL OR CARTRIDGE

Jaroslav Cherniavskyj, Skokie; Edward R. Prelletz, Chicago, and Roland R. Rucinski, Villa Park, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 26, 1970, Ser. No. 5,665
Int. Cl. G03b *1/58*
U.S. Cl. 242—192 48 Claims



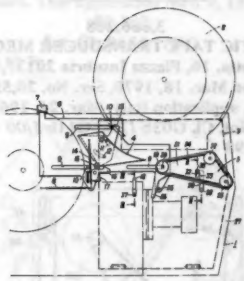
An apparatus for stripping and feeding strip material from a rotatably supported roll of such material having a leading end comprising: a stripping member having a first surface engageable with the strip material on the roll during rotation thereof to separate the leading end of the strip material from the roll and having a second surface adapted to direct the lead end of the strip material away from the roll; a drive member engageable with and adapted to drive the roll so that the leading end of the material is moved towards the stripping member; and a guide member connected to the drive member, wherein the guide member and the second surface of the stripping member cooperates to form a narrow passageway therebetween for guiding the leading end of the strip material away from the roll during rotation of the roll by the drive member.

3,666,206

STRIP-HANDLING ARRANGEMENT

Gottfried Pammer, Maria-Enzersdorf-Sudstadt, and Karl Walz, Vienna, both of Austria, assignors to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed May 15, 1970, Ser. No. 37,813
Claims priority, application Austria, June 4, 1969, A 5346/69
Int. Cl. G03b *1/58*; G11b *15/66*
U.S. Cl. 242—192 3 Claims



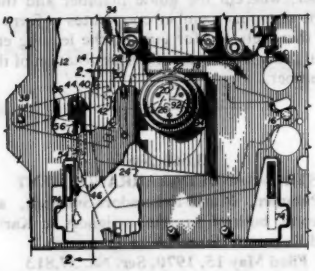
A coil holder is detachably mounted in a frame and holds a coil of strip having a leading end on the periphery of said coil. A belt drive comprises a first pulley, which is rotatably mounted in said frame on a stationary axis, a first coil-engaging element including a second pulley and mounted in said frame for movement between an inoperative position, in which said first coil-engaging element is clear of said coil holder and coil, and an operative position, in which said second pulley bears on the periphery of said coil, and a belt trained around both said pulleys and having a forward course extending from said second pulley. Drive means are operable to drive said first pulley to move said forward course of said belt away from said second pulley to rotate said coil in a strip-unwinding sense when said first coil-engaging element is in its said operative position, whereby said leading end of said strip is moved in a predetermined direction of travel. A stripper constitutes a second coil-engaging element and is mounted in said frame for movement between an inoperative position, in which said stripper is clear of said coil holder and coil, and an operative position, in which said stripper engages the periphery of said coil at a point which succeeds said second pulley in said direction of travel when said first coil-engaging element is in its said operative position, said stripper and said forward course of said belt defining between them a passage through which said strip is movable in said direction of travel away from said coil. A locking device is mounted in said frame for movement between an inoperative position and an operative position, in which it engages at least one of said coil-engaging elements and holds it against moving to its said operative position.

3,666,207

SHIFTABLE SPINDLE FOR TAPE TRANSPORT

William W. Swain, Mountain View, Calif., assignor to Cartridge Television, Inc., New York, N.Y.

Filed June 26, 1970, Ser. No. 50,244
Int. Cl. G03b *1/04*; G11b *15/32, 23/04*
U.S. Cl. 242—197 **13 Claims**



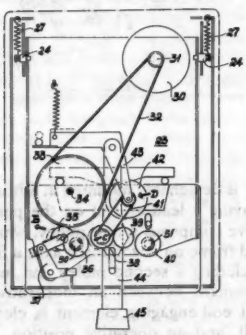
A shiftable spindle for receiving a tape reel of a tape cartridge when the latter is in an operative position relative to a base plate of a tape transport. The cartridge is received within a support having means for shifting the spindle as a function of the size of the cartridge.

3,666,208

AUTOMATIC TAPE TRANSDUCER MECHANISM

Alessandro Beretta, 16, Piazza Insubria 20137, Milano, Italy

Filed Mar. 18, 1970, Ser. No. 20,557
Claims priority, application Italy, Mar. 24, 1969, 14480 A/69
Int. Cl. G03b *1/04*; G11b *5/00*
U.S. Cl. 242—198 **7 Claims**



A tape transducer using a replaceable cartridge including a tape and two reels between which the tape is transferred upon tape drive provided by reel driving pins and capstan. The mechanism comprises an oscillatable plate carrying the pins and the capstan and the motor and transmission means for driving same, and various slide components, arm means and latching devices for causing engagement and activation of the transducer upon pushing the cartridge into the apparatus and for causing return of the transducer to fully deactivated condition and pushing out of the cartridge when complete unwinding of the tape from either reel is sensed.

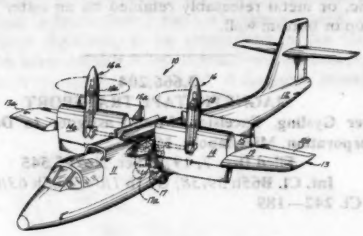
3,666,209

V/STOL AIRCRAFT WITH VARIABLE TILT WING

Frederick M. Taylor, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 24, 1970, Ser. No. 13,422
Int. Cl. B64c *27/28*
U.S. Cl. 244—7C **5 Claims**

V/Stol aircraft wiring comprising two independently rotatable fore and aft portions, both portions being movable in any position from the horizontal to the vertical positions for the most aerodynamically efficient configuration for take-



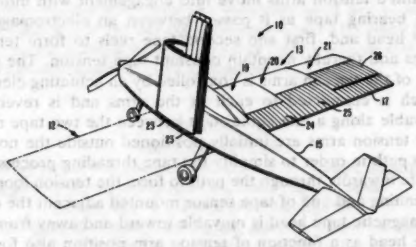
off either conventional or vertical, for climb, for landing either conventional or vertical, and for braking either in the air or while taxiing on the ground.

3,666,210

VARIABLE AERODYNAMIC STRUCTURE

Lance G. Look, Traverse City, and David G. Erickson, Williamsburg, both of Mich., assignors to Hitco, Gardena, Calif.

Filed Dec. 18, 1969, Ser. No. 886,322
Int. Cl. B64c *3/54*
U.S. Cl. 244—43 **25 Claims**



An aerodynamic or airfoil structure for a given span dimension includes a fixed spar or base portion and at least one movable portion comprising a plurality of pivotable rib elements which define a three dimensional aerodynamic structure when extended. The rib elements are hingedly mounted at one end to the fixed portion and at the other to an edge member, so as to form an internally movable parallelogram structure. When the ribs are in the compacted position, they nest against or within the fixed portion, and fold within each other. The aerodynamic or airfoil structure may be in two or more sections that are extendible spanwise through operation of an internal mechanism. Structures of this type may comprise aircraft wings, rotor blades, control surfaces, spoilers, flaps or specialized airfoil devices for atmospheric or reentry vehicles. The airfoils may have either or both trailing and leading edges that are compactible and deployable.

3,666,211

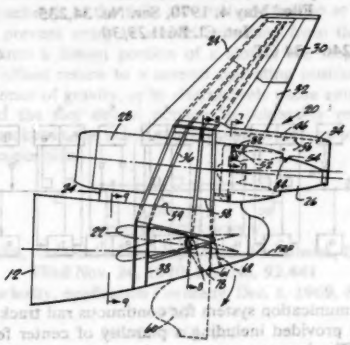
TRIJET AIRCRAFT

Richard T. Cathers, Fullerton; William M. Douglass, Palos Verdes Estates; Frederick D. Hess, Jr., Lakewood; John Morris, Newport Beach, and James E. Roberts, Long Beach, all of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Mar. 12, 1970, Ser. No. 18,960
Int. Cl. B64d *27/20*
U.S. Cl. 244—54 **19 Claims**

An aircraft having a pair of wing mounted jet engines and an aft engine of the high-bypass turbofan type mounted in

the vertical stabilizer of the tail section. The aft engine has a straight air inlet duct passing through vertical stabilizer spars attached directly to fuselage bulkheads. Each spar is a ring



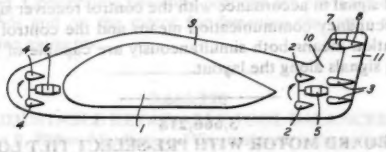
frame of a one-piece forging. A pylon beam extending aft from the base of the vertical stabilizer provides a top engine interface similar to that on the wing.

3,666,212

PROPULSION ARRANGEMENT FOR CRAFT WHICH MOVE IN A FLUID MEDIUM

Wilhelm Schmidt, Dresden, Germany, assignor to Deutsche Akademie Der Wissenschaften Zu Berlin, Berlin-Adlershof, Germany

Filed May 20, 1970, Ser. No. 39,059
Int. Cl. B64c *39/00*
U.S. Cl. 244—62 **9 Claims**



A hull is configurated as a lifting body, for instance as an airfoil, teardrop or the like. At its leading end portion one or more undulator units are mounted, each having one or more vanes which rotate about an axis normal to the longitudinal axis of the hull. This produces an undulatory fluid stream flowing opposite the intended direction of movement and providing the desired thrust. Alternate sweeping of the undulatory fluid stream over surfaces of the hull downstream of the units causes deundulation of the stream which increases the propulsive thrust.

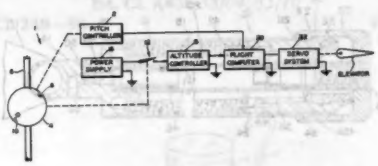
3,666,213

FLIGHT CONTROL SYSTEM INCLUDING AUTOMATIC ALTITUDE LOCKING MEANS

Laurence C. Hofmeister, Ferndale, Mich., assignor to The Bendix Corporation

Filed May 15, 1970, Ser. No. 37,550
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 D **2 Claims**

A flight control system includes a manually operated pitch command selector arranged for automatically engaging and locking the system in an altitude hold mode when pitch com-



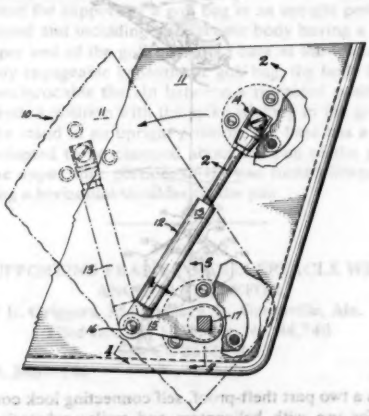
mand is zero to eliminate pilot engagement of said altitude hold mode.

3,666,214

QUICKLY REMOVABLE, PIVOTAL, AND SNUBBED STORAGE BIN

James E. Matuska, 13515 25th N.E., Seattle, Wash.

Continuation of application Ser. No. 744,933, July 15, 1968, now abandoned. This application Nov. 9, 1970, Ser. No. 88,182
Int. Cl. B64d *11/00*
U.S. Cl. 244—118 P **17 Claims**



An easily and quickly removable, pivotal, and snubbed storage bin, such as for aircraft passenger carry-on luggage having axially retractable pivotal pins extendible from the bin into recesses in support structure, as in an aircraft passenger transport, in a nonrotatable fitting and a snubber pivotally connected between the bin and the pin for snubbing relative movement between the bin and its pivot pin and accordingly between the bin and the support structure. Also disclosed is a quickly retractable and snubbing pivot pin mechanism comprising an extendible means, snubbing means, and link means nonrotatably and slideably connected to the extendible pin means and pivotally connected to the snubbing means.

3,666,215

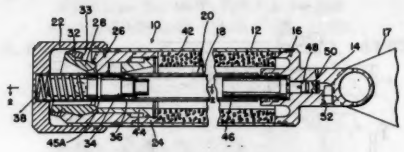
ROCKET CATAPULT EJECTOR ARRANGEMENT

Osyp Nimylowycz, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed May 7, 1970, Ser. No. 35,373
Int. Cl. B64d *25/10*
U.S. Cl. 244—122 AB **5 Claims**

A rocket catapult ejector arrangement for ejecting an occupant-seat mass from a disabled aircraft in which a swivel-

ing rocket nozzle is assembled at a tilted position with a launch tube extending through a nozzle throat portion having an eliptical configuration and lying in a plane that is non-perpendicular to the longitudinal axis of the nozzle member. This minimizes ball joint leakage around the nozzle and provides more uniform gas flow and thrust during operation.



3,666,216

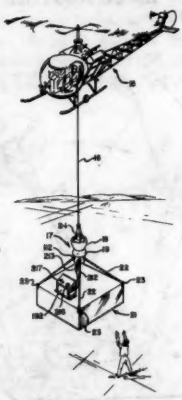
THEFT-PROOF SELF-CONNECTING LOCK COUPLING DEVICE FOR HELICOPTERS AND TOW SUBMARINES

Charles E. Nagy, 3221 Benda Place, Hollywood, Calif., and John F. Nagy, 785 West End Ave., New York, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,097

Int. Cl. B64c *1/22*

U.S. Cl. 244—137 **11 Claims**



This is a two part theft-proof, self connecting lock coupling device for use with helicopters and trailer submarines by which the coupling parts can be readily centered with one another and the grip members of one coupling part extended about a ball-shaped head of the hitch pin on the other part and lock devices associated with the one coupling part to hold the grip members upon the hitch pin so long as the coupling device in the case of the helicopter has the load suspended with the cable under strain and wherein the lock devices are automatically released when the load is placed upon the ground and the strain of the cable released, and wherein the grip devices will upon release of the lock devices automatically function under spring action to release the hitch pin. The hitch pin on the other coupling part as a result of this action is automatically released and its trigger pin extended to close a switch and effect automatically the retraction of the hitch pin so that the hitch pin is made unavailable for further connection with the one coupling part bearing the grip members until the hitch pin is extended by one who has a lock key to the coupling part to throw a switch which will drive the electric motor to operate a jack screw that will extend the hitch pin. The submarine trailer coupling device is automatic in the retraction of the hitch pin on the trailing part, but the tow coupling part is operated by an air cylinder device working directly upon the grip members of the same between coupled and decoupled positions.

3,666,217

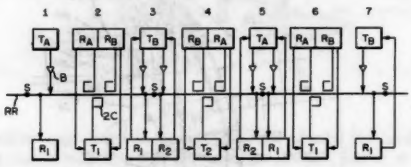
TRACK COMMUNICATION SYSTEM FOR CONTINUOUS RAIL

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed May 4, 1970, Ser. No. 34,235

Int. Cl. B61l *23/30*

U.S. Cl. 246—34 CT **6 Claims**



A communication system for continuous rail track layouts has been provided including a plurality of center fed track circuits. The improvement comprises train occupancy communication means including a plurality of track transmitters each selectively tuned to one of two transmission frequencies alternately coupled to the rails at spaced intervals representing the center of the track circuits and a plurality of receivers each selectively responsive to the transmitter frequencies coupled to the rails at the ends of each of these track circuits for receiving signals from the associated transmitter. Means coupled to the receiver generates an occupancy signal when the communication is cut off for one transmitter and its associated receiver by a vehicle shunt. Control communication means is also included wherein a plurality of control transmitters are each selectively tuned to one of two transmission frequencies different from the track transmission frequencies and are alternately coupled to the rails at each of the adjacent ends of the first track circuits representing a second set of center fed track circuits. A plurality of receivers again each selectively responsive to the transmitter frequencies are coupled to the rails at the center of each of the second set of track circuits for receiving signals from its associated transmitter. Means coupled to each control receiver generates a control signal in accordance with the control receiver signals. The occupancy communication means and the control communication means both simultaneously are capable of transmitting signals along the layout.

3,666,218

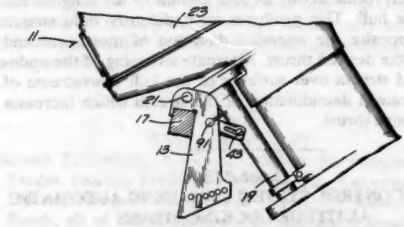
OUTBOARD MOTOR WITH PRE-SELECT TILT LOCK

Marcus W. Hagen, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 12, 1970, Ser. No. 88,585

Int. Cl. F16m *13/02*

U.S. Cl. 248—4 **5 Claims**



Disclosed herein is an outboard motor including means connecting a swivel bracket and a transom bracket at a point remote from the horizontal tilt axis therebetween and operative in response to pivotal movement of the swivel bracket to a fully elevated position to selectively afford either return of the swivel bracket to normal operating position under the in-

fluence of gravity or retention of the swivel bracket in a raised position. The means for selectively affording return or retention of the swivel bracket includes a follower link and a stop link, together with means for selectively biasing the stop link for movement relative to the follower link when the swivel bracket is in the fully elevated position so as to alternatively prevent entry of a stud extending from the swivel bracket into a detent portion of a slot in the stop link to thereby afford return to a normal operating position under the influence of gravity, or to alternatively cause entry of the stud into the slot detent portion to releasably retain the swivel bracket in the raised position against return to normal operation position.

3,666,219

MOTOR ASSEMBLY

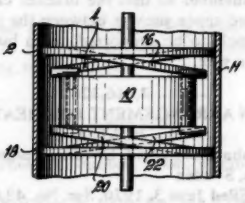
Heinz Baus, Am Oberen Luisenpark 28, Mannheim, Germany

Filed Nov. 24, 1970, Ser. No. 92,441

Claims priority, application Germany, Dec. 1, 1969, P 19 601 97.9

Int. Cl. F16f *15/04*

U.S. Cl. 248—15 **10 Claims**



A motor is accommodated with some clearance in a tubular housing axially spaced end portions of which respectively extend beyond the motor. A pair of mounting elements are provided each being located at one of the end portions and each including a ring portion secured to the housing and having a diameter slightly larger than the motor and a pair of arms of one piece with the ring portion and each semi-circularly curved circumferentially of the housing and having a free end. Cooperating fastening portions are provided on the free ends and on the motor for fastening the latter to the mounting elements.

3,666,220

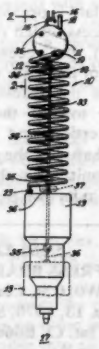
ADJUSTABLE RETAINABLE TOOL BALANCER

Thomas F. Rider, Manitowoc, Wis., assignor to Imperial-Eastman Corporation

Filed June 25, 1970, Ser. No. 49,603

Int. Cl. F16l *3/16*

U.S. Cl. 248—52 **18 Claims**



A tool balancer having means for adjustably retaining a tool in any one of a plurality of vertically related positions. The balancer includes means for powering the tool.

3,666,221

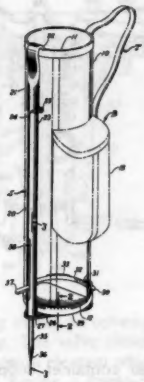
GOLF BAG STAND

Vincent P. Schilz, 1174 Paularino Ave., Costa Mesa, Calif.

Filed July 27, 1970, Ser. No. 58,593

Int. Cl. A63b *55/04*, *55/10*

U.S. Cl. 248—96 **9 Claims**



A stand for supporting a golf bag in an upright position on the ground and including a telescopic body having a hook at the upper end of the golf bag and a base at the lower end of the body engageable beneath the golf bag, the body having a spike reciprocable therein between a retracted position and an extended position with the spike sticking in the ground to hold the stand in an upright position; the base has a flexible band adapted to be clamped about the pan of the golf bag with the upper edge portions of the pan turned inwardly and engaging a horizontal shoulder on the pan.

3,666,222

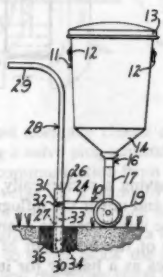
SUPPORTING FRAME FOR RECEPTACLE WITH ANCHOR THEREFOR

Arthur U. Griggers, 351 Hickory St., Greenville, Ala.

Filed Oct. 28, 1970, Ser. No. 84,740

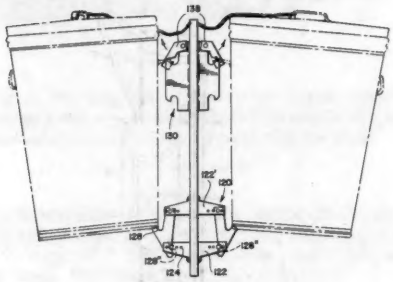
Int. Cl. B65f *1/14*

U.S. Cl. 248—146 **1 Claim**



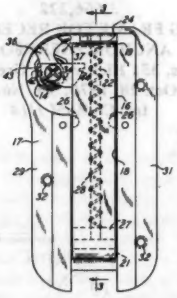
Wheel supported frame supporting receptacle and carrying upstanding sleeve. Lower portion of upstanding locking member telescopes into upstanding sleeve and detachably held in lower extended position and upper retracted position. Anchored sleeve in fixed location receives lower portion of locking member while in extended position detachably connecting frame to anchored sleeve.

3,666,223
REFUSE CONTAINER SUPPORT
Arvel H. Moore, 150 Chattahoochee Ave. N.W., Atlanta, Ga.
Filed Nov. 19, 1970, Ser. No. 91,032
Int. Cl. B65f *1/14*
U.S. Cl. 248—149 **2 Claims**



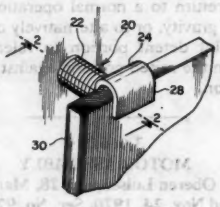
A vertical refuse container support possessing a novel securing bracket device for holding the refuse container above the ground is described.

3,666,224
SELF-RETRACTABLE HANGER
Charles J. Domanico, 150 Meadow Lane, Racine, Wis.
Filed Oct. 23, 1970, Ser. No. 83,543
Int. Cl. A47f *5/08*
U.S. Cl. 248—203 **6 Claims**



A housing having a reciprocally movable hook supported in the housing and under the influence of a spring. A key-actuated lock also influences the position of the hook to extend an angled end of the hook out of the housing. The angled hook end serves as a hanger for items, such as a fire extinguisher suspended on a wall, and, when the extinguisher is removed from the hanger, the hook automatically retracts into the housing so that it cannot again be used until the lock is rotated by the key. A finger is connected with the lock for engaging the hook and extending it from the housing, when the lock is rotated. Also, a pawl is connected with the finger for extending into the path of the hook and preventing the hook from being exposed from the housing, except for the use of a key.

3,666,225
STABILIZER BRACKET
Morris Weinberger, 245 West 10th St., New York, N.Y.
Filed Apr. 6, 1970, Ser. No. 25,831
Int. Cl. F16m *11/32*
U.S. Cl. 248—205 A **4 Claims**



A bracket for stabilizing a laterally unsupported surface. The bracket includes a compression member and is also provided with means for adjusting the effective length of the compression member so that the bracket can be positioned within a limited space such as between the unsupported surface of an article to be supported and a buttressing surface such as a room wall.

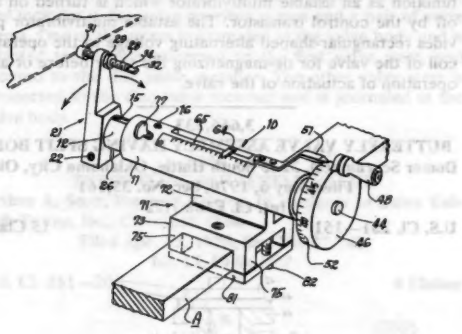
3,666,226
SUSPENSION ARRANGEMENT FOR HEAT EXCHANGER PLATES
Karl Borje Johansson, Lund, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden
Filed June 3, 1970, Ser. No. 43,011
Claims priority, application Sweden, June 13, 1969, 8428/69
Int. Cl. F28b *3/00*
U.S. Cl. 248—214 **2 Claims**

A heat exchanger plate is provided in its upper edge with a dove-tailed shaped recess which receives a horizontal flange of a suspension shaft, the recess being partly defined by spaced edge portions of the plate which rest upon the flange. At the lower part of the recess, the plate has a section protruding upwardly toward the shaft and operable to prevent substantial vertical and lateral movements of the plate relative to the shaft; but the recess adjacent this section is dimensioned to permit removal of the plate from the shaft by swinging the plate in its own plane.

3,666,227
GAUGE FOR PRESS BRAKES AND THE LIKE
Robert Frederick, 23W010 St. Charles Rd., Glen Ellyn, Ill.
Filed Feb. 13, 1970, Ser. No. 11,119
Int. Cl. B66d *3/00*
U.S. Cl. 248—228 **4 Claims**

An adjustable gauge for use with press brakes, shears and the like machines wherein sheet material is formed or cut

and the forming or cutting is to be a specified distance from a reference edge of the sheet. The gauge is provided with a novel form of saddle to enable the gauge to be affixed non-



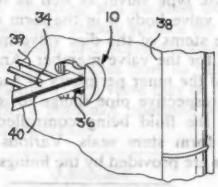
rotatably to one guide bar extending from left to right or non-rotatably to a second guide bar extending fore and aft or, as a plurality, to both bars.

3,666,228

REFRIGERATOR CLIP

Emmons S. Arnold, Columbus, Ohio, assignor to Owens-Illinois, Inc.

Filed Nov. 9, 1970, Ser. No. 87,889
Int. Cl. A44b *21/00*
U.S. Cl. 248—250 **2 Claims**



This invention relates to a holding device or fastener adapted to positively engage and secure refrigerator inner components during shipping and usage of the refrigerator. The clip or fastener of this invention comprises a U-shaped device which is adapted to cooperate with wall plugs or brackets on the inner walls of a refrigerator to secure the refrigerator inner components with respect to the refrigerator body. A number of different size and shape clips are taught by this invention to attach a variety of refrigerator inner components to the different types of wall plugs or brackets which are utilized to position the refrigerator components.

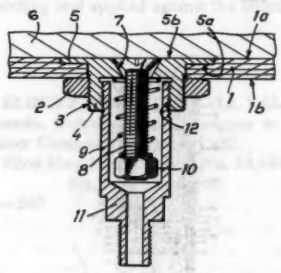
3,666,229

VALVE APPARATUS FOR SHUTTERING REMOVAL

Pierre A. M. Carrel-Billiard, Savigny-Sur-Orge, France, assignor to Materiel Special D'Enterprises, Juvisy-sur-Orge, France

Filed May 18, 1970, Ser. No. 38,216
Int. Cl. B28b *7/12*
U.S. Cl. 249—66 **6 Claims**

A valve apparatus for use in the removal of shuttering by means of compressed air or other gas. The apparatus comprises a valve body insertible into an aperture in a shuttering plate and having a flange formed at one end thereof for abutment with the inside surface of the shuttering plate. The valve body has a hollow cylindrical portion which extends from the flange and is externally screw-threaded to engage a nut which can be screwed towards the flange so as to clamp the shuttering plate between the nut and the flange, thereby securing the valve apparatus in position. The cylindrical body portion is also connectible with a pipe for supplying compressed air or other gas and accommodates a valve closure



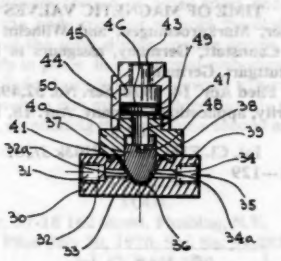
device which normally closes an opening through the flange end of the valve body. The valve closure device preferably has a frusto-conical closure element which seats in said opening, the opening also having a frusto-conical configuration but the angle of taper of the closure element being greater than that of the opening, the maximum diameters of the closure element and opening being substantially equal.

3,666,230

ELASTOMATIC VALVE

Richard S. Pauliukonis, 6660 Greenbrier Dr., Parma Heights, Ohio

Filed Aug. 3, 1970, Ser. No. 60,238
Int. Cl. F16k *7/12*
U.S. Cl. 251—63.5 **1 Claim**



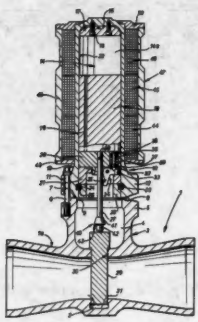
A membrane operated normally closed or normally open two-way valve including a valve plug adjustable from a closed first position blocking communication from an inlet port to a discharge port, or vice-versa, by a manually adjustable screw acting on a valve plug in contact with one side of such membrane and working against the forces of a fluid on the other side of this membrane to either block the fluid communication between the inlet and discharge ports or to permit such communication when the screw is withdrawn, or by a pilot operator, the piston of such pilot operator replacing the screw and working against the plug when energized by either air or hydraulic fluid pressure in the pilot, so constructed that the piston area of the pilot side is larger than the membrane area under the plug and on the other side of the membrane resulting in a mechanical advantage in which the piston pilot pressure can be lower than the pressure of the fluid valved.

3,666,231

SEALED VALVE WITH ELECTROMAGNETIC ACTION

Luciano Parodi, Turin, and Giancarlo Ghia, Carmagnola, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Jan. 28, 1970, Ser. No. 6,490
Claims priority, application Italy, Mar. 10, 1969, 50920 A/69
Int. Cl. F16k *31/06*
U.S. Cl. 251—129 2 Claims



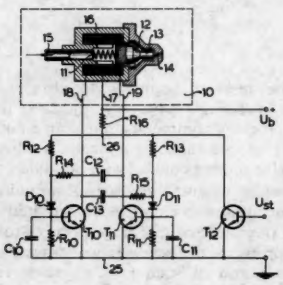
A main conduit through which fluid flows has a hollow transverse protrusion sealed to it. A gate-type closure member is slidable from the protrusion into the conduit to block it. A magnetic core is connected to the closure member and slides in the protrusion cavity. The body of the protrusion is non-magnetic. At least three winding surround the protrusion body and are selectively excited to open and close the valve by moving the core and with it the closure member. Latch-type rockers are provided to lock the closure member in one of its positions.

3,666,232

METHOD AND MEANS FOR REDUCING THE RESPONSE TIME OF MAGNETIC VALVES

Kurt Melcher, Markgroeningen, and Wilhelm Vogel, Stuttgart-Bad Cannstatt, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 14, 1970, Ser. No. 32,495
Claims priority, application Germany, Apr. 18, 1969, P 19 19 702.5
Int. Cl. F16k *31/06*; H03k *3/281*
U.S. Cl. 251—129 3 Claims



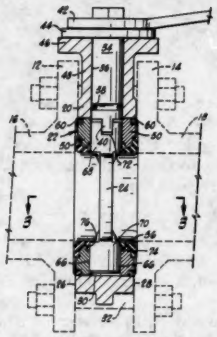
A method and apparatus for reducing the response times of electromagnetically controlled valves. The operating coil of the valve has a center tap connected to a D.C. supply voltage, whereas the end terminals of the coil are each connected to the collectors of two power transistors. The base supply voltages for the power transistors are derived from a voltage divider, and a control transistor has its emitter-collector path connected across the base voltage supply of the power transistors. The power transistors are connected to function as an astable multivibrator which is turned on and off by the control transistor. The astable multivibrator provides rectangular-shaped alternating voltage to the operating coil of the valve for de-magnetizing the valve before or after operation of actuation of the valve.

3,666,233

BUTTERFLY VALVE ASSEMBLY HAVING SPLIT BODY

Domer Scaramucci, 3245 South Hattie, Oklahoma City, Okla.

Filed May 6, 1970, Ser. No. 35,161
Int. Cl. F16k *1/22*
U.S. Cl. 251—151 15 Claims



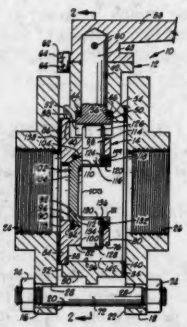
A valve assembly for use between pipe flanges employing an operating housing radially supporting the valve body of a butterfly or disc type valve, as well as supporting the valve operator. The valve body is in the form of two rings shaped to support the stems of the disc valve member and form at least one seat for the valve member. An elastomer lining is formed around the inner periphery of each ring and forms a seal with the respective pipe flange to isolate the operating housing from the fluid being controlled. Also, the linings cooperate to form stem seals. Various arrangements and shapes of seats are provided by the linings.

3,666,234

SPHERICAL DISC VALVE ASSEMBLY

Domer Scaramucci, 3245 South Hattie, Oklahoma City, Okla.

Continuation-in-part of application Ser. No. 763,644, Sept. 30, 1968, now Patent No. 3,531,081. This application Aug. 27, 1969, Ser. No. 853,238
Int. Cl. F16k *51/00*, *25/00*
U.S. Cl. 251—151 11 Claims



A disc valve assembly, particularly useful between flanges, which utilizes a housing unit and a separate valve unit. The

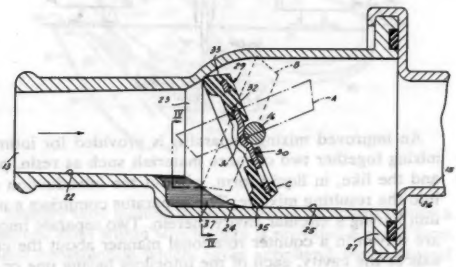
housing unit and the valve unit are adapted so that a minimum contact area is established therebetween. The housing unit provides a supporting housing adapted to be supported between the flanges, and includes a first valve stem. The valve unit is sized to be inserted in the housing unit and includes a disc valve member, a seat and a pair of valve stems. One of the stems is journaled in the valve body and is adapted to be interconnected to the first valve stem, and secured to the disc valve member. The other valve stem is connected to the disc valve member and is journaled in the valve body.

3,666,235

THROTTLING BUTTERFLY VALVE

Arthur A. Scott, Prospect Heights, Ill., assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio

Filed Apr. 13, 1970, Ser. No. 27,742
Int. Cl. F16k *1/22*
U.S. Cl. 251—205 **4 Claims**



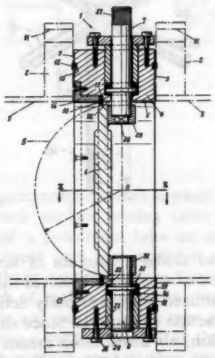
Butterfly fluid flow valve having substantial flow in the full open position of the valve. The valve has a peripheral sealing lip compressed along a frusto-spherical contoured seating surface, as the valve moves to its closed position, to provide a leak-proof seal. A throttling slot extends axially along the frusto-spherical contoured seating surface for approximately one-half of valve rotation and accommodates a decreasing throttling flow as the valve moves from its full open position towards its closed position. The valve may be operated either by a vacuum motor, a manually operated lever or by any other suitable operating means.

3,666,236

BUTTERFLY VALVE

Jean Gachot, 179 Avenue de la Division Lerclerc, Enghien, France

Filed Mar. 2, 1970, Ser. No. 15,435
Claims priority, application France, May 7, 1969, 6906499; May 29, 1969, 6917528; Aug. 4, 1969, 6926718
Int. Cl. F16k *1/22*
U.S. Cl. 251—306 **8 Claims**



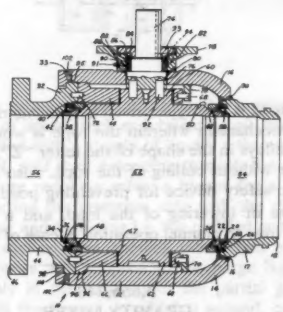
A butterfly valve intended for use in a piping system and comprising a body pierced by a duct located opposite to the two sections of the piping system and a closure disc rotatably mounted on the valve body and offset laterally with respect to its axis of rotation; the valve disc is provided at its periphery with a convex annular bearing face, the valve body is fitted with an annular seal which projects into the interior of the duct and said annular bearing face constitutes a seating for the seal in the closed position. A high standard of leak-tightness in the closed position of the valve is achieved owing to the combination of the offset valve disc and of the annular projecting seal applied against the bearing face of the valve disc.

3,666,237

WELDED FABRICATED BALL VALVE

Jack E. Piccardo, Oakland, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed May 21, 1970, Ser. No. 39,459
Int. Cl. F16k *27/00*
U.S. Cl. 251—367 **6 Claims**



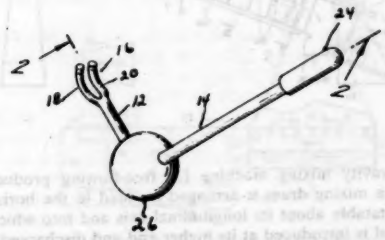
A valve body construction comprising a tubular body member with a closure received in one end thereof against an internal abutment. A lock ring engages against the outer face of the end closure around its outer edges and is welded to one end of the body member to hold the closure in place, contraction of the weld during cooling serves to clamp the closure tightly in place. In a preferred embodiment, the other end of the tubular body is swaged inward to a small diameter opening whereby a hub may be welded directly to the edge of the opening, eliminating the need for a second end closure.

3,666,238

TOOL

Henri Weber, 57-18 162 Street, Flushing, N.Y.

Filed July 30, 1970, Ser. No. 59,482
Int. Cl. B66f *3/00*
U.S. Cl. 254—131.5 **4 Claims**

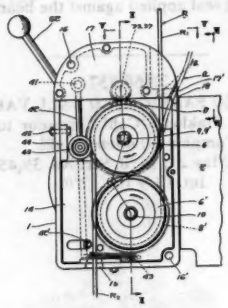


This invention relates to an improved tool such as may be used to pry windshield wiper arms from their supports. The fulcrum point is resilient to avoid damage to paint or glass on a vehicle.

3,666,239
WINCH

Atsuo Koshihara, 25-2 Ohmino, Sakai, Osaka Prefecture, Japan

Filed Aug. 13, 1970, Ser. No. 63,415
Int. Cl. B66d 1/22
U.S. Cl. 254—175.5 12 Claims

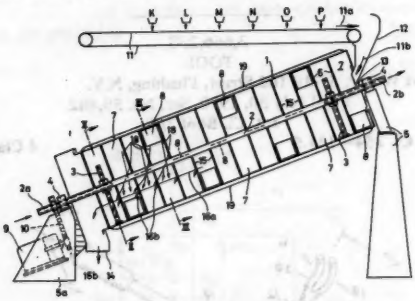


This winch is of a type driven by a prime mover, and comprises a mechanism wherein the rope is wound around two driving pulleys in the shape of the letter "Z", providing tractive force without coiling of the rope. Also included are an automatic safety device for preventing possible accidents in the course of lowering of the load, and a mechanism for changing over to manual operation in case of emergency.

3,666,240
GRAVITY MIXER

Wilhelm Lodige; Fritz Lodige; Josepf Lucke, and Karlheinz Luke, all of Paderborn, Germany, assignors to said Wilhelm Lodige, Fritz Lodige and Josef Lucke, all of Paderborn, Germany, by said Karlheinz Luke

Filed Apr. 29, 1969, Ser. No. 820,266
Claims priority, application Germany, May 14, 1968, P 17 57 478.6
Int. Cl. B01f 9/06, 15/06
U.S. Cl. 259—3 9 Claims

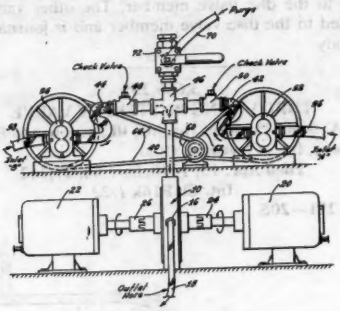


A gravity mixing machine for free-flowing products in which a mixing drum is arranged inclined to the horizontal and rotatable about its longitudinal axis and into which the material is introduced at its higher end and discharged at its lower end. The drum is divided into a plurality of successive mixing chambers by the provision of radially extending plates.

3,666,241
MIXING APPARATUS

Carlo Re, Santa Ana, Calif., assignor to Dyna-Shield, Inc., Santa Ana, Calif.

Filed Nov. 9, 1970, Ser. No. 87,837
Int. Cl. B01f 7/04
U.S. Cl. 259—6 3 Claims

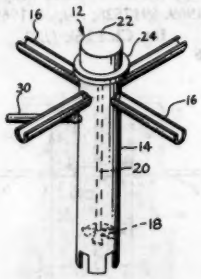


An improved mixing apparatus is provided for intimately mixing together two or more materials such as resin, paints, and the like, in liquid form, without the introduction of air into the resulting mixture. The apparatus comprises a mixing unit having a circular cavity therein. Two separate impellors are driven in a counter rotational manner about the central axis of the cavity, each of the impellors having one or more radially extending blades. The blades have fingers positioned to intermesh with one another as the impellors are driven in the aforesaid counter rotational manner. The liquids to be mixed are introduced radially through an inlet on one side of the mixer unit and into the cavity, and the resulting mixture is discharged through a radial outlet which is positioned diametrically opposite the inlet, in accordance with an important feature of the invention.

3,666,242
WASTE TREATMENT APPARATUS AND CIRCULATION UNIT THEREFOR

Rolland L. Fifer, P.O. Box 13175, Louisville, Ky.

Filed Feb. 18, 1971, Ser. No. 116,461
Int. Cl. B01f 7/22
U.S. Cl. 259—8 6 Claims



In the activated sludge treatment of sewage and similar wastes the method of treatment involves the use of a tank in which sewage is mixed with previously activated sludge and subjected to the action of bacteria. Since oxygen is necessary for bacterial action, air distributing means are employed in such units. Herein a circulation and oxygenation cell is disposed in the aeration chamber adapted to draw floating

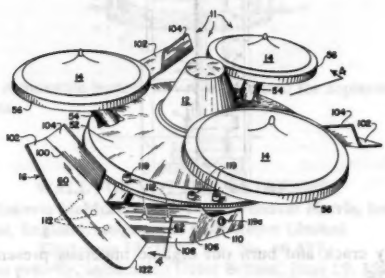
material through the circulating unit from a plurality of zones at spaced points about the surface of the liquor.

3,666,243

SAND MULLING OR CONDITIONING APPARATUS AND PLOW CONSTRUCTION THEREFOR

Angelo J. Bisinella, Niles, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed Jan. 27, 1971, Ser. No. 110,180
Int. Cl. B02c *15/00*
U.S. Cl. 259—107 9 Claims



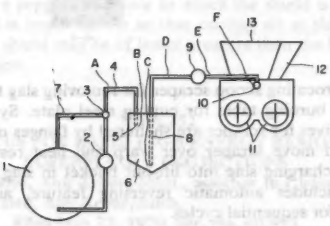
A foundry sand mulling or conditioning apparatus having a cylindrical bowl within which there is provided a novel form of plow construction which, upon peripheral travel around the bowl, functions in a novel manner to elevate the sand and produce a rolling and rotating torus of sand within the bowl.

3,666,244

PROCESS FOR PRODUCING CUTBACK ASPHALT MIXTURES

Shigeho Nomura, Tokyo, and Keijiro Murata, Yokohama, both of Japan, assignors to Sakimura Research Institute Inc., Tokyo, Japan

Filed Aug. 17, 1970, Ser. No. 64,367
Claims priority, application Japan, Aug. 22, 1969, 44/65967
Int. Cl. C10c *3/10*
U.S. Cl. 259—148 1 Claim



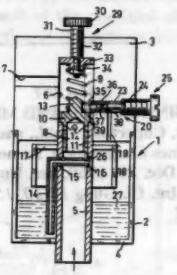
A process for producing cutback asphalt mixtures having any desired cutback asphalt mixing ratio by measuring a dope consisting of a petroleum type or coal type solvent alone or said solvent and any additive required for the production of cutback asphalt per one batch and adding the same to one batch of molten asphalt during its flow from a kettle to a mixer in any existing batch type mix plant without previously preparing a cutback asphalt in the kettle and then mixing one batch cutback asphalt thus produced with one batch of a measured aggregate in the mixer.

3,666,245

DEVICE FOR MIXING A GAS CURRENT UNDER PRESSURE WITH AN ATOMIZED MIST OF LIQUID FLUID, SUCH AS LUBRICATING OIL

Svante Roland Edwardson, Solna, Sweden, assignor to AB Dentatus, Hagersten, Sweden

Filed Feb. 1, 1968, Ser. No. 702,404
Claims priority, application Sweden, Feb. 14, 1967, 2066/67
Int. Cl. F16n *7/34*, *27/00*; B01f *5/20*
U.S. Cl. 261—55 3 Claims



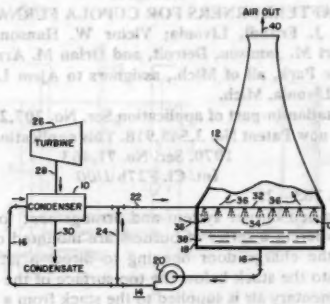
A device for mixing a gas current under pressure with an atomized mist of liquid, such as lubricating oil, having a casing partially filled with a supply of liquid, a through duct for the gas current, said duct extending through the casing and having a pressure reducing valve, a bypass for a partial gas current connecting the upstream side with the downstream side of the valve and including i.a. the unfilled portion of the casing, and a suction tube opening into a first atomization area in the bypass and adapted to discharge liquid drawn from the supply in the casing into the partial gas current flowing through the bypass, in which a second, controllable atomization area is provided connected in parallel with the valve in the through duct and in series with the first atomization area to introduce the partial gas current enriched by the liquid into the gas current flowing through the duct. The outlet opening of the bypass has a valve seat cooperating with a portion of the valve in a manner such as progressively to close the outlet of the bypass in response to opening movements of the valve.

3,666,246

COOLING SYSTEM

Paul Cohen, Madison, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1970, Ser. No. 26,198
Int. Cl. B01f *3/04*
U.S. Cl. 261—151 10 Claims



A cooling system suitable for a power plant which includes a steam condenser, for transferring heat from the steam to an

aqueous solution; a cooling tower for spraying or distributing thin streams of the aqueous solution in the presence of ambient air to transfer heat to the air; and means for recirculating the aqueous solution between the condenser and the cooling tower including bypass means for controlling the solution temperature; the aqueous solution containing compound in an amount approaching saturation at room temperature, for example, from about 50 to about 60 grams of magnesium chloride per 100 grams of water, the solution being characterized by very low water vapor pressure when used as the heat dissipating fluid medium in a spray type cooling tower.

3,666,247

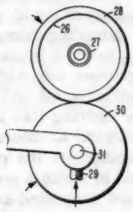
FUSING DEVICE AND METHOD

Willard K. Banks, Cupertino, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,666

Int. Cl. G03g *13/20, 15/20*

U.S. Cl. 263—6 E **3 Claims**



A fusing device is described for fixing resinous powder images to a substrate such as paper comprising a rotating heating element in contact with a rotating backup member. Pressure means applies a meshing force between the heated member and backup member so that it is not necessary for the heated member in contact with the powder image to carry an offset preventing liquid on its surface. The fusing device is employed in reproduction apparatus, such as electrophotographic apparatus.

3,666,248

AFTERBURNERS FOR CUPOLA FURNACES

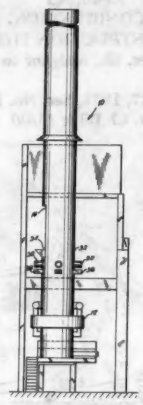
Ronald J. Frundl, Livonia; Victor W. Hanson, Westland; Robert M. Jamison, Detroit, and Orlan M. Arnold, Grosse Pointe Park, all of Mich., assignors to Ajem Laboratories, Inc., Livonia, Mich.

Continuation-in-part of application Ser. No. 707,250, Feb. 21, 1968, now Patent No. 3,545,918. This application Sept. 11, 1970, Ser. No. 71,463

Int. Cl. F27b *1/00*

U.S. Cl. 263—29 **16 Claims**

An in-bed burner system and arrangement for stack furnaces wherein a series of burners are mounted on the stack below the charge door opening to direct a jet of burning gases into the stack below the top surface of the charge bed. Supplementary air is supplied to the stack from a position adjacent the burners to support relatively complete combustion of the products of combustion rising in the stack. Oxygen can augment or replace the supplementary air. The in-bed burners and supplementary air effect burnout of carbon monoxide in the stack exhaust gases and maintain a relatively high temperature in the top portions of the charged bed to thermally crack and burn out organic materials present in the charge.



3,666,249

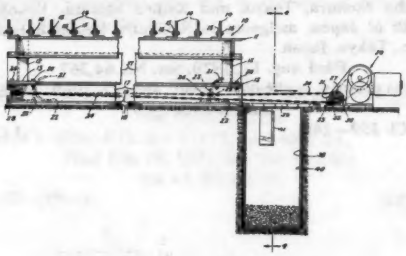
SLAG SCAVENGER FOR FLAME BURNING TABLE

Cameron MacLeod, Jr., Glen Moore, Pa., assignor to Merris, Wheeler & Co., Inc., Philadelphia, Pa.

Filed June 5, 1970, Ser. No. 43,905

Int. Cl. F23j *1/02*

U.S. Cl. 263—45 **11 Claims**



Reciprocating scoop scraper for removing slag from below a flame burning table for cutting steel plate. Synchronized chain drives for scraper are sheltered by flanges of table bed rails and move scraper over warp and heat resistant level bed, discharging slag into lift-out bucket in slag pit. Power drive includes automatic reversing feature, and manual cycling for sequential cycles.

3,666,250

FURNACE AND METHOD OF MAKING SAME

Joseph F. Hensenne, Bonniers, Belgium, assignor to Elphiac, Brussels, Belgium

Filed Sept. 9, 1970, Ser. No. 70,865

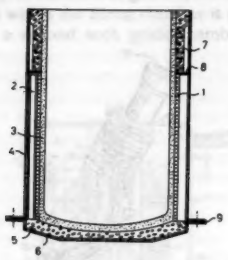
Claims priority, application Belgium, Sept. 11, 1969, 78956

Int. Cl. F23m *5/00*

U.S. Cl. 263—46 **5 Claims**

A furnace and a method of manufacturing such a furnace wherein a refractory concrete base is prepared at the bottom of a cylindrical tank, an induction coil is then placed over the base and thereafter puddled clay is packed inside the coil to

form a crucible. The base is prepared separately in a removable bottom cover which is fixed to the cylindrical part and a



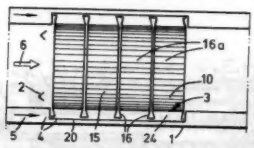
further removable bottom cover is prepared for replacement purposes.

3,666,251

WALL FOR HOT FLUID STREAMS

David Roberts McMurtry, and Derek Percival Harris, both of Bristol, England, assignors to Rolls-Royce Limited

Filed June 15, 1970, Ser. No. 46,437
Claims priority, application Great Britain, June 19, 1969, 30,996/69
Int. Cl. F23m 9/00
U.S. Cl. 263—50 **5 Claims**



The disclosure of this invention pertains to a heat shield for jet pipes in gas turbine engines. The heat shield comprises a sheet of heat-resisting alloy having flat portions joined by parallel folds and wherein both the flat portions and the folds are formed into corrugations extending at right angles to the folds. In this way the heat shield is two-dimensionally expansible to accommodate differential expansion between the shield and a support structure to which the shield is secured. The shield is impermeable so that cooling air at the "cold" side of the shield may be of lesser pressure than the hot gases in the jet pipe.

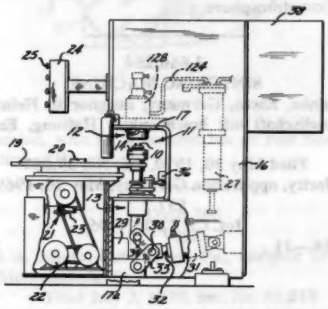
3,666,252

APPARATUS FOR RAPID HIGH ENERGY REMOVAL OF SUPERFLUOUS PROJECTIONS

Edwin E. Rice, Ann Arbor, Mich., assignor to Chemotronics, Incorporated, Ann Arbor, Mich.

Filed May 25, 1970, Ser. No. 40,992
Int. Cl. C21d 1/82
U.S. Cl. 266—2 R **10 Claims**

A machine or apparatus for the rapid high energy (transient thermal) treatment of articles requiring removal of superfluous projections (burrs and the like) is described in which a closed chamber is formed by action of the device to contain the thermal energy and article. The closed chamber encloses void volumes adjacent to the surfaces of the articles having superfluous projections. Closure elements acting with an article support element are actuated in forming the closed chamber or vessel. At least one of the closure elements is movable for closure toward and away from the other closure element. Preferably the movable closure element actuates the article support element in a holder such that a closed chamber is formed around the article. The movable closure element moves the support element in the holder in forming the closed chamber such that when a transient thermal energy release is generated in the chamber the holder does not bear any direct loading from the energy release. Preferably, a combustible gaseous composition is injected under pressure into the chamber void space between the closed chamber cavity and articles and a rapid thermal energy release reaction is initiated after achievement of suitable charge pressure. The device of the present invention fully contains the shock of the rapid thermal energy release and the consequent pressure rise and the result of the confined chamber reaction is the removal of superfluous projections from the parts placed



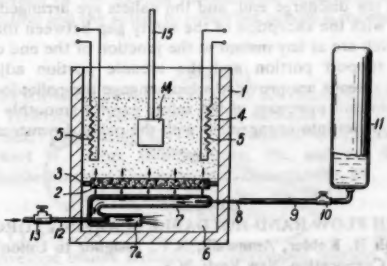
in the chamber. The device includes sealing means between the article support element and the closure element functioning to form the chamber. The sealing means is preferably a replaceable seal which is protected by a mated or precision fit of male and female parts between the seal and the chamber. Fuel passage means are also provided leading to the chamber cavity with valving securing the chamber against exhaust of the reaction products or residue during the reaction. The machine is adapted for sequential treatment of articles in tooling which forms the chambers and which tooling can be varied to accommodate different article space requirements. A coolant may be utilized for the tooling where required by the cycle rate of the device.

3,666,253

FLUIDIZED BED FURNACE

Yuri Yoshio, 11-3, Gohonga 2-chome, Meguro-ku, Tokyo, and Tanaka Yukio, 16, Shimouma 4-chome, Setagaya-ku, Tokyo, both of Japan

Filed Dec. 24, 1970, Ser. No. 101,266
Claims priority, application Japan, Dec. 26, 1969, 44/104328
Int. Cl. C21d 1/06
U.S. Cl. 266—5 E **5 Claims**



A fluidized bed furnace comprising a furnace body including an upper section and a lower section separated by a gas

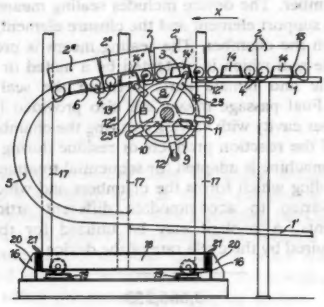
permeable gas distributor, a fluidized bed contained in said upper furnace body section, electric heating means supported within said upper furnace body section for heating said fluidized bed, a pressure chamber provided in said lower furnace body section for receiving a mixture gas therein under a predetermined pressure, an evaporator means provided in said pressure chamber for receiving liquefied hydrocarbon gas and for evaporating the liquefied gas, and an air supply line extending through one wall of said furnace body in the lower section thereof into said evaporator means whereby said hydrocarbon gas from the evaporator means and air from said air supply line are mixed together and the mixture gas is passed through said gas distributor to heat said fluidized bed in cooperation with the electric heating means and at the same time, said gas distributor is maintained at a low temperature while the fluidized bed is maintained in a nonoxidation atmosphere.

3,666,254

SINTERING MACHINE

Walter Stanke, Essen, Germany, assignor to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed May 20, 1970, Ser. No. 39,057
Claims priority, application Germany, May 30, 1969, P 19 27 537.7
Int. Cl. F27b *21/06*
U.S. Cl. 266—21 **10 Claims**



A sintering machine including a travelling grate formed by a plurality of pallets which are moved along an endless path defined by an upper and a lower support portion connected at the discharge end of the machine by an arcuate portion. The pallets are pushed along the upper support portion toward the discharge end, and the pallets are arranged end-to-end with the exception of the safety gap between the pallets which are at any instant at the junction of the end of the upper support portion and the arcuate portion adjacent thereto. Means are provided which engage the pallet located at any instant upstream of the safety gap for smoothly moving the pallet into engagement with the pallet downstream of the gap.

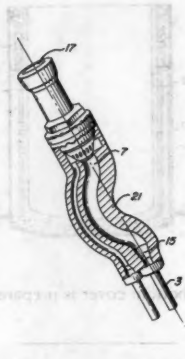
3,666,255

HIGH FLOW HAND-HOLDABLE SCARFING TORCH

Rudolph H. Kohler, Amawalk, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,664
Int. Cl. B23k *7/06*
U.S. Cl. 266—23 P **2 Claims**

A hand-holdable scarfing torch capable of utilizing high oxygen flow rates and providing a 30 to 50 percent increase



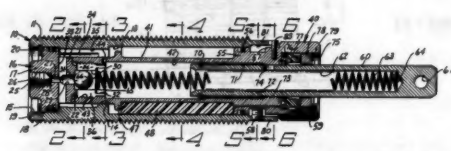
in scarfing pass width as compared with existing scarfing torches of comparable thrust.

3,666,256

ADJUSTABLE SHOCK ABSORBER

Larry C. Ellis; William J. Chorkey, both of Farmington, and Robert J. Heideman, Detroit, all of Mich., assignors to Ace Controls, Inc., Farmington, Mich.

Filed Dec. 4, 1969, Ser. No. 882,081
Int. Cl. B60g *11/56*; F16f *9/34*
U.S. Cl. 267—34 **9 Claims**



An adjustable fluid shock absorber including, a shock absorber body provided with an accumulator chamber and a piston chamber, a piston rod having its inner end slidably mounted in said piston chamber and its outer end extending outwardly of said body to an initial position for engagement by a member to be decelerated, fluid passage means between said accumulator chamber and said piston chamber, said chambers and passage means being filled with a fluid, a metering slot means interconnecting said fluid passage means with said piston chamber for metering the amount of fluid forced from said piston chamber to said accumulator chamber when a shock load is impressed on said piston rod, and, means for returning the piston rod to the initial position after a shock load is removed from the piston rod and for normally maintaining the piston rod in the initial position.

3,666,257

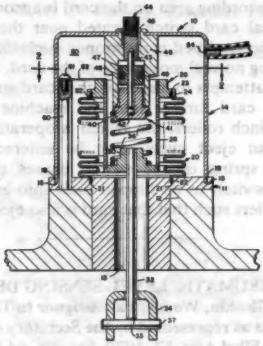
NEGATIVELY PRELOADED THRUST UNIT

Johannes Sorteberg, Sorteberg Controls Corp., 540 Connecticut Avenue, South Norwalk, Conn.

Filed May 15, 1970, Ser. No. 37,501
Int. Cl. F16f *5/00*
U.S. Cl. 267—170 **7 Claims**

A pressure-responsive load cell comprises an output thrust member coaxially positioned within an externally pressurized bellows. The thrust member is attached to one end of the bellows, passes through and extends beyond the opposite end of the bellows. The portion of the thrust member within the bellows is a hollow cylinder in which a compression spring is located to provide a bias thrust towards the output end of the

thrust member. In order to stabilize this inherently unstable configuration and to keep the assembly friction free, a thin, flat, narrow, very flexible metal guide is attached to the end of the bellows to which the thrust member is attached. To increase stability, a second such guide member may be em-



ployed. The second guide may be in the same plane as the first guide and separated therefrom by an angle of less than 180° to prevent positive biasing of two guides in one direction and to insure smooth movement of the guided assembly.

3,666,258

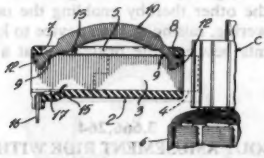
ELECTRIC MOTOR BRUSH SPRING

Paul Emile Gaudry, 40 Ouimet Street, Laval des Rapides, Quebec, Canada

Filed Oct. 9, 1970, Ser. No. 79,511

Int. Cl. F16f 13/00

U.S. Cl. 267—179 **1 Claim**



A brush holder having a fine pitch extension-like coil spring which is used flexurally as a brush spring and has integrally formed ends adapted for slidable retention in a slot-like track adjacent and parallel to the brush.

3,666,259

APPARATUS FOR FASTENING A SPECTACLE GLASS MOUNT OR LENS MOUNT ON A WORK OR CLAMPING TABLE

Fritz Kotting, Sturzelberg, Germany, assignor to Firma Wernicke & Co., Dusseldorf-Eller, Germany

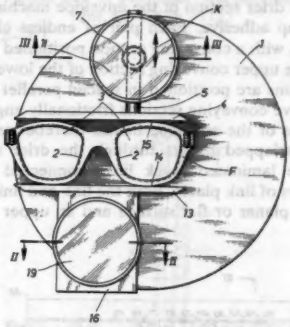
Filed Oct. 9, 1969, Ser. No. 865,085

Claims priority, application Germany, Nov. 5, 1968, G 68 05 428

Int. Cl. B25b 1/02

U.S. Cl. 269—90 **4 Claims**

The invention relates to an apparatus for fastening a glass mount on a work or clamping table of a scanning, grinding,



etc. machine, with an adjustable bar or rule bearing against one section of the mount.

3,666,260

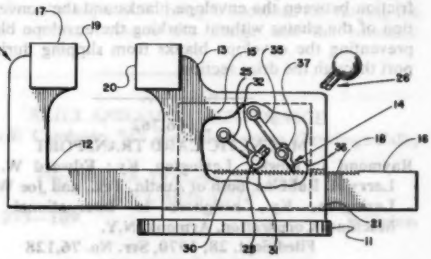
VISE

Herman A. Myers, Lake Lynn, Pa., assignor to Insta-Snap, Inc., Monongahela, Pa.

Filed July 2, 1970, Ser. No. 51,818

Int. Cl. B25b 1/02, 1/14, 5/16

U.S. Cl. 269—214 **1 Claim**



An instant lock power vise comprising a sliding jaw having a shaft portion slidably positioned through an opening in a rigid jaw. The rigid jaw contains a housing chamber in which a floating link and toothed cam, in combination with a breaking dog link, engage teeth along the shaft of the sliding jaw to permit rapid locking adjustment. A handle engages the toothed cam to permit an increased grip or a complete disengagement of the locking mechanisms, depending upon the direction and the extent to which the handle is moved.

3,666,261

APPARATUS FOR CONVEYING ENVELOPE BLANKS THROUGH THE SEAL FLAP ADHESIVE DRYING SECTION OF AN ENVELOPE MAKING MACHINE

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

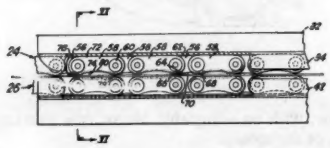
Filed Sept. 17, 1970, Ser. No. 73,118

Int. Cl. B65h 29/12

U.S. Cl. 271—45 **10 Claims**

Envelope blanks arranged in overlapped relation with the seal flap portions exposed are conveyed past a seal flap gummer mechanism where a roll applicator continuously applies a liquid gum adhesive to the seal flap portions of the envelope blanks. The overlapped envelope blanks are slightly separated to space the portions of the seal flaps having the

wet adhesive thereon to prevent the blanks from adhering to each other. The overlapped and slightly separated envelope blanks are then conveyed by two pairs of endless chains through the drier section of the envelope machine to dry the wet seal flap adhesive. Each pair of endless chains has an upper chain with a conveying section positioned in juxtaposition with the upper conveying section of the lower chain. The pairs of chains are positioned in spaced parallel relation and the respective conveying sections frictionally engage the side flap portions of the envelope blanks therebetween and convey the overlapped blanks through the drier section. The chains have laminated block links connected to adjacent lines by pairs of link plates. Both the link and link plates have a generally planar or flat surface and an upper arcuate surface with raised end portions and a recessed intermediate portion. The chains formed from the link blocks and link plates thus have a generally flat surface and a curved surface with outwardly extending spaced, raised portion. The conveying section the the upper chains have the curved surface with the spaced, raised portions engaging the overlapped envelope blanks and the conveying sections of the lower chains have the flat surface engaging the envelope blanks. The lower chains are coated with a silicone rubber to increase the friction between the envelope blanks and the conveying section of the chains without marking the envelope blanks and preventing the envelope blanks from slipping during transport through the drier section.



3,666,262

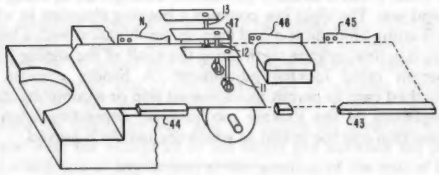
MAGNETIC CARD TRANSPORT

Raymond L. Fowler, Lexington, Ky.; Edward W. Parken; Larry H. Robbins, both of Austin, Tex., and Joe W. Woods, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 28, 1970, Ser. No. 76,128

Int. Cl. B65h *9/16*

U.S. Cl. 271—52 **5 Claims**



A magnetic card transport which includes three drive rollers. A forward drive roller for driving the magnetic card toward the entry throat for recording character by character and for ejecting the card from the transport; a reverse drive roller for positioning the card in an opposite direction for read checking a previously recorded character; and a high speed reverse drive roller for positioning the card at the beginning of a track during initial entry from the throat and from the end of a previously recorded track. The three drive rollers continuously rotate beneath the card and the card is caused to move by application of a pinch roller to the card to press it into rolling contact with its associated drive roller. A fixed guide rail is provided and the card is biased against the fixed guide rail by means of guide springs. Further, to prevent misalignment of the card during reading and writing the pinch rollers associated with the forward and reverse drive rollers are canted such that the resultant moments of force are in a direction to bias the card against the fixed drive rail.

The entry/exit throat of the card transport, the drive rollers and the magnetic head are located such that optimum utilization of the recording area on the card is accomplished. In addition, a dual card switch located near the innermost extremity of the card bed is positioned such that it is not contracted during normal movement of the card, but in the event an operator attempts to insert another card and thereby force the original card further into the machine and out from under the pinch rollers, the switch is operative to signal the logic that an eject cycle must be entered into and the mechanical spring of the switch causes the card which tripped the switch to be flipped back into engagement with the drive rollers such that that card is also ejected.

3,666,263

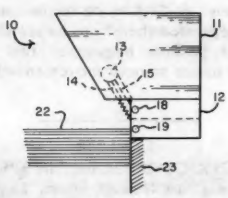
PNEUMATIC LEVEL SENSING DEVICE

Richard S. Gluskin, Wayne, Pa., assignor to The United States of America as represented by the Secretary of the Army

Filed Aug. 17, 1970, Ser. No. 64,521

Int. Cl. B65h *1/18*

U.S. Cl. 271—56 **3 Claims**



This device relates to a level sensing assembly useful in card or document transport systems. Fluid pressure is supplied to various orifices and interact therein. As cards or documents are stacked, the cards interrupt the flow of fluid thereby producing output control signals. Orifices are placed one above the other thereby enabling the output signals to control a lowering, raising or feed device to keep the level of the documents between the orifices or at a predetermined level.

3,666,264

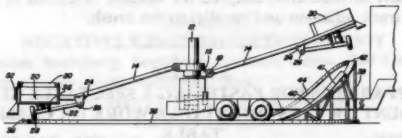
ROUNDABOUT AMUSEMENT RIDE WITH JUMP RAMP

Norman Bartlett, M-601 2910 Point East Drive, North Miami Beach, Fla.

Filed Sept. 24, 1970, Ser. No. 75,084

Int. Cl. A63g *1/34*

U.S. Cl. 272—29 **4 Claims**



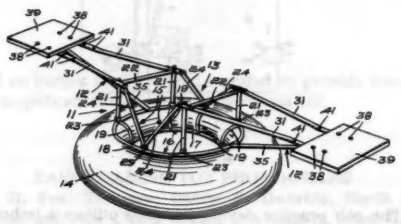
An amusement ride of the roundabout type with a plurality of radiating arms each having an inner end connected to a central support for vertical swinging movement and a passenger carrier at the outer end. The passenger carrier is supported from a circular pathway by a wheel and cushioning assembly with the pathway including a curved jump ramp, safety bridge and landing ramp to simulate the action of a ski

jump and provide a pathway closely underlying the wheel of the passenger carrier but spaced therefrom as it moves from the jump ramp to the landing ramp.

3,666,265
WATER SEESAW DEVICE

Harvey F. Ammerman, 125 Edgell Road, Framingham, Mass., and Alexey P. Radsky, Riverside Drive, Augusta, Maine

Filed Mar. 18, 1970, Ser. No. 20,550
Int. Cl. A63g *11/00*
U.S. Cl. 272—56 **7 Claims**

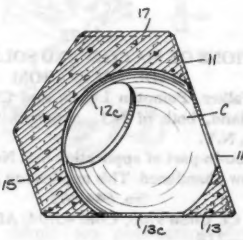


Disclosed is an amusement device with a flat bottomed, buoyant base retaining oppositely directed, cantilevered seat assemblies. With the device in a balanced position, the seat assemblies lie a substantial distance above surface of a supporting body of water. Consequently, occupants of the seat assemblies engaged in seesaw activity can attain relatively high magnitudes of acceleration and velocity before becoming submerged.

3,666,266
PLAYGROUND MODULE

Isamu Noguchi, 33-38 Tenth Street, Long Island City, N.Y.

Filed Mar. 5, 1969, Ser. No. 804,531
Int. Cl. A63b *9/00*
U.S. Cl. 272—60 **5 Claims**

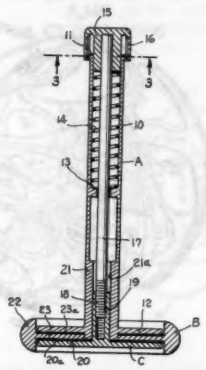


A structural module which lends itself to the construction of playground edifices for climbing and crawling. The module is in the form of a tetrahedron whose four corners are truncated to define four triangular minor faces that are disposed in parallel relation to four major hexagonal faces, the module having a spherical central cavity. The radius of the sphere is greater than the distance between the geometrical center of the module and any major face thereof, circular ports in the major faces of the module being formed by the intersection of the spherical cavity and the major faces. A group of such modules may be interfitted in various ways, side by side as well as one above the other, to create an edifice in which one major face of each module abuts a major face of an adjacent module and in which the ports of the abutting faces are in registration, thereby interconnecting the cavities of the modules to produce a labyrinth.

3,666,267
WRIST EXERCISER

James C. McKinney, 122 Covington Road, Greenville, S.C.

Filed Oct. 6, 1969, Ser. No. 863,853
Int. Cl. A63b *21/22*
U.S. Cl. 272—67 **3 Claims**

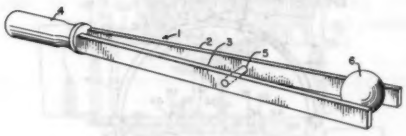


An exercising device for the hands, wrist and forearms including an elongated bar having an enlarged flange integral with one end thereof. An enlarged rotatable member is carried at right angles to the bar in frictional contact with the flange. A friction producing member is carried between the flange and the rotatable member resisting forces exerted by the hands tending to turn the bar with respect to the rotatable member. An adjustable spring is provided for varying the frictional contact between the flange and the rotatable member.

3,666,268
SKILL AND AMUSEMENT DEVICE

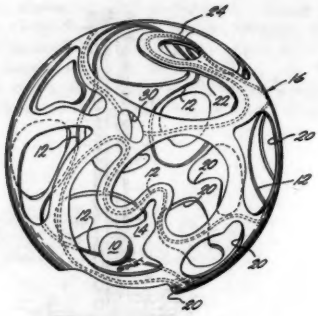
Amerigo E. Candusso, 748 Alameda Avenue, Cuyahoga Falls, Ohio

Filed Feb. 25, 1970, Ser. No. 14,016
Int. Cl. A63b *67/14*
U.S. Cl. 273—109 **8 Claims**



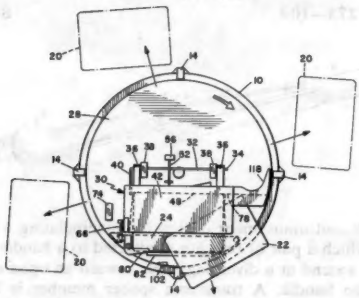
A skill and amusement device for manipulating a rolling ball in which a pair of rails are connected to a handle at one end and extend at a diverging angle toward an open end opposite the handle. A transverse spacer member is located near the longitudinal center of the guide rails. The spacer may be adjustable to vary the angle of divergence of the rails. The body member is held by the handle with the rails inclined downwardly to permit a ball to roll along the tops of the rails toward the open end. Near the open end the rails are spaced apart sufficiently to permit the ball to pass between the rails. At the instant the ball starts to pass downwardly between the rails, the body member is quickly rotated 180° so that the bottom surfaces of the rails now become the top surfaces and the angle of inclination of the rails is reversed to permit the ball to return toward the handle along the top of the rails. This manipulation can be repeated over and over until the player drops the ball. Other variations are included in the invention such as spiral tracks, wavey tracks, obstacles in the tracks and deflectors at the open end of the tracks.

3,666,269
SPHERICAL GAME
David W. Gilchrist, 215 W. Water Street, Elmira, N.Y.
Filed June 5, 1970, Ser. No. 43,744
Int. Cl. A63b 67/00
U.S. Cl. 273—115 5 Claims



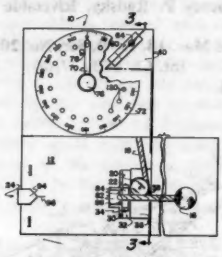
A maze-like game featuring a non-linear, three-dimensional surface across which a ball having a relatively small distance is caused to move to follow a premarked path which is traced between and through certain holes communicating from the surface to a point exterior to the game.

3,666,270
CARD DEALER
Frank A. Mazur, 3150 Bonita Mesa Road, Bonita, Calif.
Filed Feb. 8, 1971, Ser. No. 113,339
Int. Cl. A63f 1/14
U.S. Cl. 273—149 R 8 Claims



A rotary dealer for playing cards, adapted to be placed more or less centrally of a playing surface and capable of receiving a deck of cards and distributing or dealing the cards into the required number of hands at player's stations, the magazine for the cards being tiltable upwardly for easy loading and the cards being dealt from the top of the deck by initially skewing the top card radially outward from the magazine to be arrested by one of the stops spaced peripherally on a fixed base so that the skewed card is ejected longitudinally as well as radially outwardly and falls at the corresponding player's station.

3,666,271
GOLF PRACTICE DEVICE
Peter Honnef, 32 Harding Street, Wethersfield, Conn.
Continuation-in-part of application Ser. No. 752,226, Aug. 13, 1968. This application Jan. 31, 1971, Ser. No. 106,005
Int. Cl. A63b 69/36
U.S. Cl. 273—185 C 8 Claims



The golf practice device disclosed utilizes a tethered golf ball for practicing or playing a simulated game of golf. A rotatable drum is mounted on a base and a tether secured to the golf ball is guided from the golf ball over a roller and pulley on the base to the rotatable drum where the tether is attached so it can be wound onto the drum and subsequently paid out from the drum when the golf ball is hit with a conventional golf club from a tee on the base. An adjustable brake is coupled to the rotatable drum to impose braking forces on the drum and a distance indicator coupled to the drum for rotation with the drum is used to measure the force with which the golf ball is hit. A hook and slice indicator having tether position sensing members located adjacent the roller and straddling the tether is actuated by the tether when the ball is hit to indicate the direction of flight of the ball. Both the distance indicator and the hook and slice indicator may be connected to an electrical display arrangement.

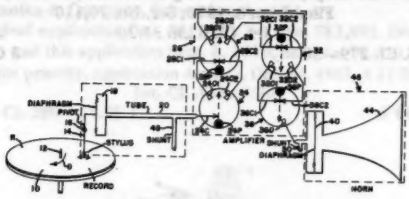
3,666,272
COMPOSITIONS OF MATTER AND SOLID GOLF BALLS MADE THEREFROM
James L. Walker, Pompton Lakes, and Chester T. Chmiel, Newfoundland, both of N.J., assignors to Uniroyal, Inc., New York, N.Y.
Continuation-in-part of application Ser. No. 561,016, June 28, 1966, now abandoned. This application June 7, 1967, Ser. No. 644,065
Int. Cl. C08d 9/08; C08f 45/04; A63b 37/00
U.S. Cl. 273—218 12 Claims

This invention relates to both a composition of matter and a unit construction or solid golf ball made therefrom. The composition, which is comprised of (1) a polybutadiene elastomer, (2) a gum plastic, (3) filler, (4) a polyunsaturated co-curing monomer ester, and (5) a source of free radicals, is readily molded into the golf ball form.

3,666,273
FLUIDIC SOUND REPRODUCTION SYSTEM
Robert A. Kantola, Scotia, N.Y., and Norman H. West, Decatur, Ill., assignors to General Electric Company
Filed Jan. 13, 1970, Ser. No. 2,473
Int. Cl. G11b 9/00
U.S. Cl. 274—6 7 Claims

To economically reproduce sound from a record, a fluidic

sound reproduction and amplification system is provided. This system embraces a phonograph pickup, a fluidic amplifier and an output horn coupled together to provide low-cost audio amplification with virtually unlimited life.

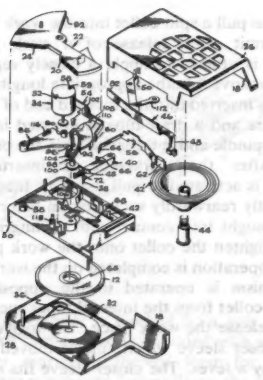


3,666,274

EASY LOADING TOY PHONOGRAPH

James H. Fox, Torrance; Darryl R. Dworkin, North Hollywood, and Han Chung Leung, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 21, 1970, Ser. No. 100,250
Int. Cl. G11b *25/04*
U.S. Cl. 274—9 B **12 Claims**



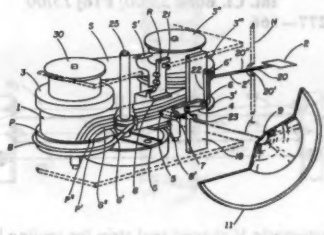
A relatively simple toy phonograph for playing interchangeable disc records including a control lever with an eject knob for ejecting a record and a replay knob for replaying it, both on the same surface as the slot through which the record moves. When the replay knob is depressed, a first camming portion thereon pivots a lever that lifts the tone arm and a second portion thereon moves the tone arm to the outer edge of the record to replay it. When the eject knob is depressed, it pivots an eject lever which has camming surfaces that raise a spindle to release the record, pivot the lever that lifts the tone arm, push against the rim of the record to eject it, push the tone arm to the periphery of the turntable, and open the motor energizing circuit. When a new record is inserted, it pushes the eject cam to automatically start the mechanism to play the new record. An electrically conductive spring member is provided that has one arm at the battery case for contacting a battery terminal, another arm in contact with an electric motor terminal, and a pair of additional arms that function as mechanical springs.

3,666,275

PHONOGRAPH APPARATUS

John C. Heine, Cambridge; Edward M. Kerwin, Jr., Weston, both of Mass., and Colin G. Gordon, Ayr, Scotland, assignors to Bolt Beranek and Newman, Inc., Cambridge, Mass.

Continuation of application Ser. No. 613,874, Feb. 3, 1967, now abandoned. This application Jan. 23, 1970, Ser. No. 5,349
Int. Cl. G11b *25/06*
U.S. Cl. 274—11 R **5 Claims**



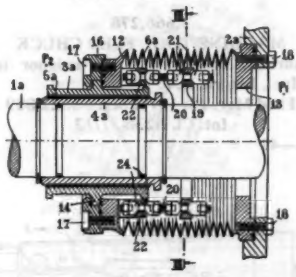
This invention embodies a linearly driven phonograph record tape having substantially parallel record grooves, and a novel apparatus for selecting the groove to be played by appropriate spring-drive tensioning means.

3,666,276

DEVICE FOR THE SEALING OF A ROTATABLE SHAFT

Robert Hubler, Paris, France, assignor to Societe D'Etudes et de Developpement des Industries Modernes (S.E.D.I.M.), Le Plessis Robinson (Hauts de Seine), France

Continuation-in-part of application Ser. No. 635,470, May 2, 1967, now abandoned. This application Dec. 11, 1969, Ser. No. 884,201
Int. Cl. F16j *15/16*; F16r *41/00*
U.S. Cl. 277—30 **3 Claims**



A sealing device affording a moderate leakage for the passage of a rotary shaft extending through the wall of a casing in which the internal fluid pressure differs from the external pressure, this device comprising in combination a tubular socket surrounding said rotary shaft, the inner surface of said socket having a small annular clearance with respect to the outer surface of said rotary shaft, so that these two surfaces provide therebetween an annular passage permitting a limited fluid flow between said casing and the surrounding atmosphere. At least one of the two registering cylindrical surfaces, namely the inner surface of said socket and the outer surface of the corresponding portion of said shaft, is provided with a lining of a material having a low coefficient of friction. A bellowseforming sleeve of flexible material connects said socket to the wall of said casing through which said rotary

shaft extends and said socket is restrained against movement in longitudinal direction.

3,666,277

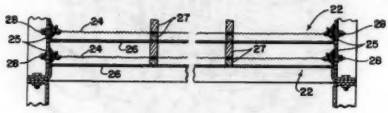
EDGE SEAL STRIP FOR A TENSION SCREEN

Louis E. Hubach, Aurora, and Edgar E. Hardner, Willoughby, both of Ohio, assignors to W. S. Tyler Incorporated, Mentor, Ohio

Original application Dec. 24, 1968, Ser. No. 786,670, now Patent No. 3,557,953. Divided and this application Aug. 18, 1970, Ser. No. 64,742

Int. Cl. B65d *53/00*; F16j *15/00*

U.S. Cl. 277—166 5 Claims



An elastomeric V-shaped seal strip for sealing between the edge of a material separating screen and a supporting side wall includes apertures which extend through the apex of the V to receive shafts of screen tensioning bolts. The shafts substantially bisect the angle formed between the diverging legs of the V to provide equal tensioning pressure for each leg. A concave sealing surface extending longitudinally along the length of the seal strip where the legs merge serves to seal against the edge of the screen. Convex sealing surfaces on the distal ends of the legs serve to seal against the side wall. The flexing butterfly shaped seal strip bridges the gap between the screen and side wall and allows tightening or loosening of the tensioning bolts without leakage of material from above the screen around its edges.

ERRATUM

For Class 277—234 see:
Patent No. 3,666,001

3,666,278

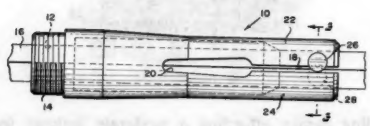
MACHINE TOOL FEED CHUCK

Earl C. Andrews, Bresport, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Mar. 26, 1970, Ser. No. 22,889

Int. Cl. B23b *31/12*

U.S. Cl. 279—41 7 Claims



This invention is a machine tool feed chuck including a cylindrical body having a longitudinal bore through which a bar passes. The body is provided with opposed longitudinal slots forming leaves comprising jaws for holding the bar under tension. The leaves are urged toward each other at one end of the cylindrical body in order to obtain tension on the bar. In order to reduce the amount of deflection of the leaves between the working and inoperative positions, stop plugs are mounted in the leaves of the cylindrical body, the stop plugs extending across the slots into engagement with a portion of the opposite leaf, thereby preventing the leaves under tension from closing fully at the front end, and holding the chuck partially open when in the inoperative position.

3,666,279

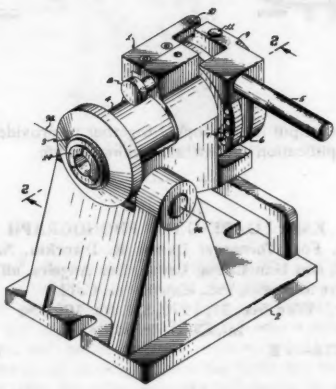
COLLET CLOSING MECHANISM FOR A MACHINE TOOL

Robert L. Coope, 1830 West Virginia Avenue, Phoenix, Ariz.

Filed Sept. 8, 1970, Ser. No. 70,110

Int. Cl. B23b *31/20*

U.S. Cl. 279—50 3 Claims



In order to pull a split collet into the work holding position and to permit rapid release of a work piece, a toggle mechanism is utilized to apply a closely regulated force to the collet to move it in the appropriate longitudinal direction. The collet is inserted into the forward end of a spindle having an axial bore and a draw tube is inserted into the opposite end of the spindle and is threaded onto the collet in the usual manner. After the workpiece is inserted, the toggle mechanism is activated to pull the draw tube, and hence the collet, slightly rearwardly such that an external taper on the collet is brought into contact with an internal taper on the spindle to tighten the collet onto the work piece. When the machining operation is completed on the work piece, the toggle mechanism is operated in the opposite direction to release the collet from the internal taper such that it can expand and release the work piece. The toggle mechanism includes a closer sleeve which can be moved rearwardly and forwardly by a lever. The closer sleeve fits slidably over the rear portion of the draw tube and is provided with three cam surfaces extending generally outwardly and rearwardly from the periphery of its axial bore. A back plate, which is secured to the draw tube behind the closer sleeve, has the captive ends of three forwardly directed toggle links pivotally secured within forwardly opening recesses. The free ends of the toggle links are provided with rollers which function as cam followers on the cam surfaces of the closer sleeve. A stationary stop disposed forward of the closer sleeve has a rearwardly extending hub portion which functions as a part of the cam surfaces the rollers follow. The rollers and the cam surfaces cooperate such that when the closer sleeve is moved to the rear, closed position, the rollers force the toggle links into an attitude parallel to the draw tube axis thereby forcing the back plate, and hence the draw tube and collet, slightly rearwardly. When the closer sleeve is moved to the forward, open position, the rollers are forced radially outwardly to pull the back plate, and hence the draw tube and collet, slightly forward to release the collet. Radiused points on the cam surfaces bring about the toggle action during the opening and closing operation to insure a self-locking characteristic to the mechanism.

3,666,280

SKI BINDING

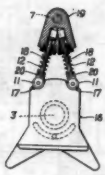
Thomas G. Smolka, Wien-Mauer, and Johann Zelinka, Wien, both of Austria, assignors to Wiener Metallwarenfabrik Smolka & Company, Schwechat, Austria

Original application Dec. 16, 1968, Ser. No. 783,891. Divided and this application Sept. 8, 1970, Ser. No. 70,419

Claims priority, application Austria, Dec. 14, 1967, A 11 285/67

Int. Cl. A63c *9/00*

U.S. Cl. 280—11.35 T **5 Claims**



A releasable ski binding utilizing a toggle structure wherein one toggle arm constitutes engaging means for the ski boot and the other toggle arm provides resilient resistance for the over-center action. Same can be utilized for either a toe binding or a heel binding.

3,666,281

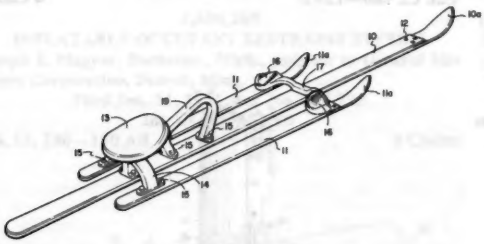
SLED FOR SNOW OR WATER

William Charles Billings, 95 Rose Lane, Redding, Calif.

Filed Dec. 22, 1969, Ser. No. 887,231

Int. Cl. B62b *13/04*

U.S. Cl. 280—12 KL **5 Claims**



A main, ski-like runner is flanked by a pair of auxiliary, outrigger, ski-like runners and is provided with a low seat on the main runner, rearwardly thereof. Rests for the heels of the rider's feet are positioned forwardly on the auxiliary runners, and an elongate, stabilizing hand-hold extends forwardly from the seat on and longitudinally of the main runner. The auxiliary runners diverge outwardly and forwardly from the main runner and the footrests are preferably formed as forwardly sloping and outwardly turned heel-retaining pad ends of a bar secured to and extending transversely of the runners. The stabilizing hand-hold is preferably a single bar of plastic material sloping upwardly and forwardly from somewhat below seat level immediately in front of the seat.

3,666,282

TOBOGGAN

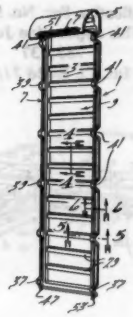
Jerome M. Buening, Birmingham; Robert M. Paulsen, St. Clair Shores, and Clifford A. Robinette, Fremont, all of Ohio, assignors to Woodall Industries Inc., Detroit, Mich.

Filed Mar. 19, 1970, Ser. No. 20,912

Int. Cl. B26b *13/00*

U.S. Cl. 280—18 **12 Claims**

A long, flat, thin board, which may be shaped into a toboggan by the ultimate user, is formed by bonding together a pair of polyethylene sheets, the lower of which is ribbed to form runners and the upper of which is ribbed to form transverse braces, the bonded marginal edges of the sheets being arched upwardly at intervals to provide support for a rope-type handrail which is also used as a means for holding the forward end in a reversely curved upright position when it is desired to use the board as a toboggan.



3,666,283

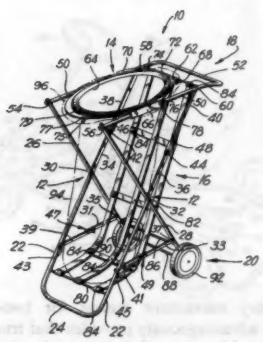
CARRIAGE FOR WASTE DISPOSAL BAGS AND THE LIKE

David Stevens, 768 Sherman Avenue, Thornwood, N.Y., and Donald Z. Blau, 21 Carrol Street, City Island, N.Y.

Filed July 17, 1970, Ser. No. 55,903

Int. Cl. B62b *11/00*

U.S. Cl. 280—36 R **5 Claims**



New and improved carriage for waste disposal bags and the like is provided and comprises a readily collapsible, generally upstanding scissor-like frame, handle and support means disposed generally atop said frame, wheel means attached to said frame to provide for the maneuverability of the carriage, bag attachment means removably attached to said handle and support means and operative to removably attach a bag thereto, and bag support means attached to said handle and support means and to said frame means adjacent to and beneath said bag attachment means to support a bag from said frame means.

3,666,284

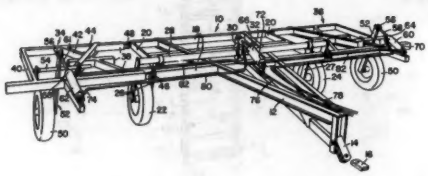
HYDRAULIC DEPTH CONTROL FOR DRAWN IMPLEMENT CARRIERS HAVING PIVOTED OUTER FRAMES

George Dwight Hunter, and Richard Wayne Hook, both of Des Moines, Iowa, assignors to Deer & Company, Moline, Ill.

Continuation of application Ser. No. 577,849, Sept. 8, 1966, now abandoned. This application July 23, 1968, Ser. No. 753,337

Int. Cl. B62d 21/18

U.S. Cl. 280—43.23 17 Claims



An implement carrier including a main frame and outrigger frames mounted on vertically movable wheels operated by a plurality of series-connected double-acting hydraulic cylinders. Each of the cylinders is provided with an integral bypass which automatically synchronizes the cylinders each time they are moved to their limit in one direction to raise the frame to its transport position and the last cylinder in the series when moving the frames to the working position is provided with an adjustable integral stop which limits the movement of the cylinders.

3,666,285

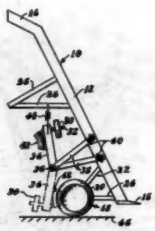
AUXILIARY MOVEMENT MEANS FOR HAND TRUCKS

William J. Fertig, 6144 Woodfox Court, Indianapolis, Ind.

Filed June 5, 1970, Ser. No. 43,686

Int. Cl. B62b 1/04

U.S. Cl. 280—47.12 8 Claims



An auxiliary movement means for two-wheeled hand truck, which advantageously provides that truck may be conveniently moved in a lateral direction, that is, transversely to the usual path of the hand truck.

3,666,286

AUTOMATIC LEVELLING ARRANGEMENT FOR VEHICLES

Ortwin Engfer, Gerlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

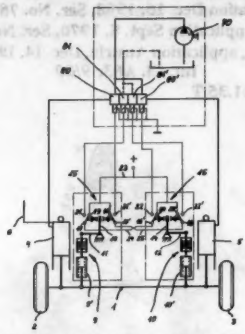
Filed Aug. 19, 1970, Ser. No. 65,091

Claims priority, application Germany, Aug. 23, 1969, P 19 44 178.2; Apr. 9, 1970, P 20 16 963.5

Int. Cl. B60g 17/04

U.S. Cl. 280—124 F 13 Claims

Switching arrangements, either mechanical or electrical, are controlled by the vehicle body level to cause operation of means, such as electromagnetically operated valves, for supplying fluid to, or withdrawing fluid from, fluid pressure leveler, in dependence on whether the body falls below, or rises above, the desired level. The switches for one leveler of an axle are connected to the switches of the other leveler of the same axle.



3,666,287

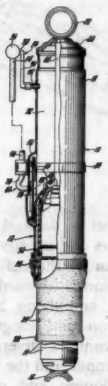
EXHAUST CONTROLLER AND COUPLING FOR VEHICLE LEVELER UNIT

Joseph W. Wanner, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1970, Ser. No. 78,000

Int. Cl. B60g 17/04

U.S. Cl. 280—124 F 4 Claims



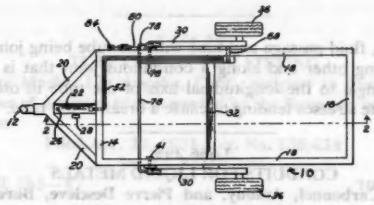
In preferred form, an exhaust controller and coupling for a vehicle leveler unit connected within a closed or semi-closed air pressure system including a pump, an inlet fitting into a pressurizable control chamber of the leveler unit. The exhaust controller is characterized by having a movable valving element operated in response to height changes of the vehicle between open and closed positions. A replaceable, resilient fitting on the leveler includes an inlet end having a flexible seat that engages the movable valving element when in its closed position; the fitting includes an exhaust end outside of the unit which is connected through a right angle elbow coupling to a return conduit from the exhaust valve assembly to the compressor inlet which is located by the elbow coupling in close spaced parallelism with the outer surface of the leveler unit.

3,666,288

SELF-ADAPTING SPRING SUSPENSION SYSTEM FOR VEHICLES

John E. Carton, 2083 Carton Way, and George A. Mertz, 1851 Carton Way, both of Grants Pass, Oreg.

Filed Sept. 9, 1970, Ser. No. 70,703
Int. Cl. B60g 11/26
U.S. Cl. 280—124 F 10 Claims



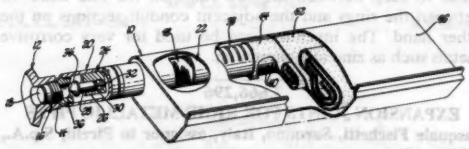
An automatically self-adapting spring suspension system is provided for road vehicles in which the springs are automatically readjusted to increase their stiffness in response to increase of load, and in response to any shock of such unusual severity that the wheels are caused to pass a predetermined point during relative approach of the wheels and chassis. Illustratively pneumatic springs are stiffened by the automatic addition of air under pressure: Provision is made for conveniently bleeding the air simultaneously and equally from the springs when a change of load, or of roughness of the road requires a reduction of spring stiffness.

3,666,289

INFLATABLE OCCUPANT RESTRAINT SYSTEM

Joseph J. Magyar, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1971, Ser. No. 105,223
Int. Cl. B60r 21/06
U.S. Cl. 280—150 AB 4 Claims



A pressure vessel containing compressed fluid has the outlet thereof sealed by a rupturable plug. The outlet communicates with a manifold which in turn communicates with one end of an elongated cylindrical diffuser. The diffuser includes longitudinal rows of partial circumferential slots. Each row communicates the diffuser with the interior of a respective inflatable occupant restraint cushion. A cylinder is supported within the manifold by radial ribs thereof engaging the interior wall of the manifold. A conical headed piston is slidable within the cylinder and the space between the piston and a closed end wall of the cylinder is filled with viscous fluid. An aperture in the closed end wall of the cylinder receives a pintle secured to the piston. The conical head of the piston is located in predetermined relationship to a fixed area orifice at the outlet of the pressure vessel. A tubular diffuser screen is inserted within the diffuser and covers the slots to the cushions. One end of the screen opens to the manifold and the other end of the screen is closed by a plug of resilient material.

3,666,290

RESILIENT LANDING GEAR FOOT

Thomas B. Dalton, and Emil E. Bundt, Jr., both of Muskegon, Mich., assignors to Westran Corporation, Muskegon, Mich.

Filed Apr. 13, 1970, Ser. No. 27,604
Int. Cl. B60s 9/00
U.S. Cl. 280—150.5 10 Claims

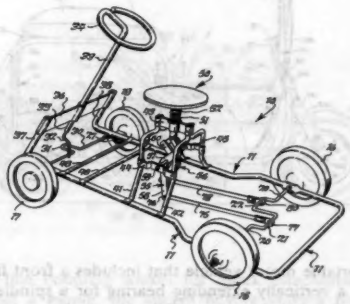
A resilient trailer landing gear foot slidably mounted on the lower end of a landing gear leg. The landing gear foot includes a resilient toroid disposed between the lower end of the leg and a ground engaging plate forming a part of the foot for providing resiliency to the foot to absorb shock loading imposed thereon.

3,666,291

OCCUPANT PROPELLED AMUSEMENT VEHICLE

Ralph G. Ortiz, 107 North Brier Road, Tonawanda, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,641
Int. Cl. B62m 1/18
U.S. Cl. 280—226 R 10 Claims



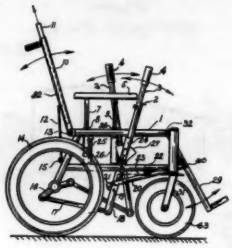
An amusement vehicle comprising an operator member such as a spring-biased seat movably mounted on a vehicle frame, in which frame supporting wheels are rotatably mounted, which operator member is adapted to be reciprocated by the rider. A motion transmission mechanism comprises a pair of links each connected at one arm portion to the operator member and pivoted in response to reciprocation of the operator member. Each link includes another arm portion which is connected to a corresponding pivot point offset from the axis of a shaft connected to at least one of the wheels, whereby the shaft and wheel are rotated as the link arm portions are moved relative to each other.

3,666,292

WHEEL CHAIR

John Bartos, Jackson Heights, N.Y., assignor to Patents and Technology Exclusives, Inc., New York, N.Y.

Filed June 11, 1969, Ser. No. 832,304
Int. Cl. B62m *1/12*
U.S. Cl. 280—234 **11 Claims**



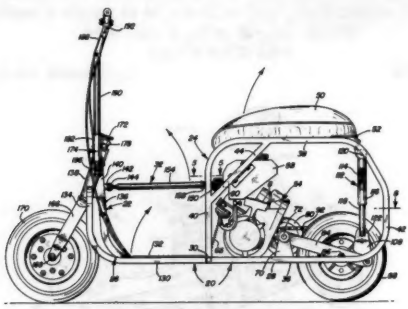
A foldable wheel chair with swingable chassis and leg rests driven by the occupant with the help of a lever mechanism is disclosed.

3,666,293

PORTABLE MOTOR VEHICLE

Erwin D. Schlaphoff, 967 Charter Drive, Covina, Calif.

Original application Jan. 2, 1968, Ser. No. 695,111, now Patent No. 3,548,963, dated Dec. 22, 1970. Divided and this application Dec. 8, 1969, Ser. No. 883,264
Int. Cl. B62k *21/18*
U.S. Cl. 280—278 **8 Claims**



A portable motor vehicle that includes a front frame that carries a vertically extending bearing for a spindle. A front wheel is journaled on the spindle. Handle bars are connectable to a head of the spindle for turning the spindle and can be disconnected and moved downwardly without removing the same from the head of the spindle.

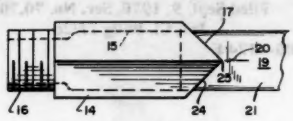
3,666,294

INLET FITTING FOR AN AUTOMOTIVE AIR CONDITIONER CONDENSER

Raymond S. Slaasted, Racine, Wis., assignor to Modine Manufacturing Company

Filed Feb. 19, 1971, Ser. No. 116,972
Int. Cl. F16l *13/04*
U.S. Cl. 285—114 **4 Claims**

An automotive air conditioner apparatus comprising a metal refrigerant flow tube of generally oval cross section with opposite flat sides joined by opposite edges, a metal fitting having opposite ends and a fluid passage through the fitting with means on one end for receiving a flexible refrigerant conduit and an opening on the other end receiving the refrigerant flow tube thereby to connect in series the



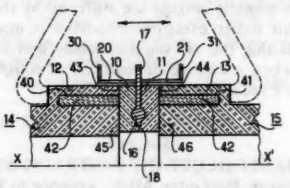
conduit, fluid passage and tube with the tube being joined to the fitting other end along a continuous joint that is at an acute angle to the longitudinal axis of the tube in order to distribute stresses tending to cause a break in the tube.

3,666,295

CONDUITS FOR LIQUID METALS

Henri Carbonnel, Antony, and Pierre Descleve, Bures-sur-Yvette, both of France, assignors to Groupement Atomique Alsacienne Atlantique (G.A.A.A.),, Le Pleissis-Robinson, France

Filed Dec. 10, 1970, Ser. No. 96,827
Claims priority, application France, Dec. 10, 1969, 6942788; Dec. 29, 1969, 6945218
U.S. Cl. 285—41 **11 Claims**



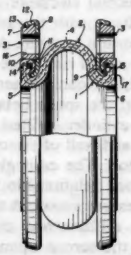
An improved seal for connecting liquid metal conduit sections. It comprises at least two rings made of fire-proof fibers, squeezed between the adjacent sections, with sealing means being provided between the rings in order to prevent leakage and cause the hardening or freezing of liquid metal which tends to seep between the two rings on the one hand, or between the rings and the adjacent conduit sections on the other hand. The invention can be used for very corrosive metals such as zinc and aluminum.

3,666,296

EXPANSION JOINTS FOR RIGID METALLIC PIPES

Pasquale Fischetti, Saronno, Italy, assignor to Pirelli, S.p.A., Milan, Italy

Filed Mar. 11, 1970, Ser. No. 18,610
Claims priority, application Italy, Mar. 13, 1969, 14043 A/69
Int. Cl. F16l *11/12*
U.S. Cl. 285—45 **10 Claims**



The disclosure relates to an expansion joint for metallic pipes, the joint comprising a reinforced rubber body in the

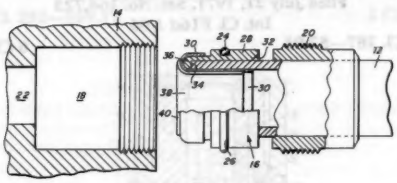
form of an annular loop having enlarged lateral edge portions and a pair of locking members for connecting the edge portions of the body to adjacent portions of the pipe ends. Each ring is provided with an undercut groove to receive a portion of the enlarged lateral edge portion. Each locking ring comprises a pair of annular elements disposed in facing contact and interlocked. The first annular element has a greater thickness and is directed towards the outer side of the rubber body. The second element extends outwardly beyond the innermost edge of the first element to thus form the undercut groove.

3,666,297

TUBE CONNECTOR FITTING

Murray Marks, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Interior

Filed Apr. 22, 1971, Ser. No. 136,438
Int. Cl. F16l *17/06*
U.S. Cl. 285—81 **10 Claims**



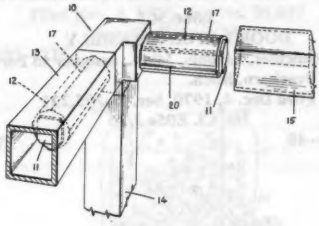
A fitting for interconnecting a tube and a fluid distribution header. O-ring and elastomeric seals prevent internal and external leakage. In one embodiment threaded connections are employed. In another embodiment concentric interlocking ridges and grooves are used.

3,666,298

CONNECTOR FOR JOINING TUBULAR MEMBERS

Frederick William Reilly, Islington, Ontario, Canada, assignor to Beautiline Limited, Downsview, Ontario, Canada

Filed Jan. 28, 1971, Ser. No. 110,397
Claims priority, application Canada, Jan. 20, 1971, 103,462
Int. Cl. E04g *7/00*
U.S. Cl. 287—54 A **4 Claims**



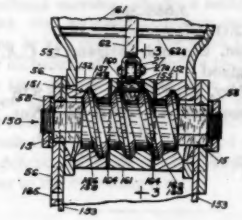
A connector for releasably joining hollow rectangular tubular members. The connector consists of a cubical body with a plurality of spigots projecting therefrom. Each spigot consists of a rigid core of polygonal cross-section enclosed within a resiliently compressible plastic casing having longitudinal ribs corresponding in number to the number of sides of the tubular member. The diameter of the spigot and casing across the ribs is less than the diameter across the diagonals of the tubular member and greater than the diameter across opposite walls of the tubular member. The locked joint is established by inserting the spigot and casing into the tubular member with the ribs aligned with the corners and, by relative rotation of the tubular member and spigot, opposed ribs are brought into an interference fit with opposed faces of the tubular member with a positive lock resulting.

3,666,299

FLEXIBLE JOINT INCLUDING BRAKING MEANS

James W. Butler, 117 Grant Avenue, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 311,785, July 26, 1963, now abandoned. This application Oct. 31, 1969, Ser. No. 873,766
Int. Cl. B25g *3/38*
U.S. Cl. 287—94 **17 Claims**



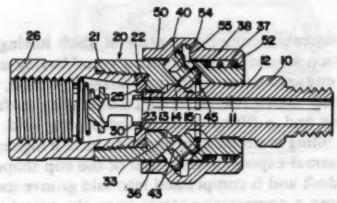
Rotatable driving and driven elements of the screw-and-threaded-sleeve type are provided with means for securing relative rotation therebetween, together with means for enabling braking or cessation, at selected intervals, of rotation with respect to each other.

3,666,300

QUICK DISCONNECT COUPLING

John G. Russell, Highland Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Mar. 26, 1970, Ser. No. 22,984
Int. Cl. F16l *37/08*
U.S. Cl. 285—316 **6 Claims**



A fluid line coupling socket for quick attachment and release from a nipple, the socket having locking pins for retaining and releasing the nipple, the pins having a pair of generally oppositely facing shoulders at one end of the pins that are directly engageable by corresponding shoulders of a sleeve on the socket for moving the pins into and out of locking position.

3,666,301

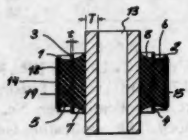
PIVOT OR SUPPORT SLEEVE WITH RESILIENT LAYER

Raoul Jorn, D-8992 Hengnau, Post Wasserburg A. B., Germany

Filed Nov. 2, 1970, Ser. No. 86,167
Claims priority, application Germany, Nov. 4, 1969, P 19 55 308.3
Int. Cl. F16b *7/00*
U.S. Cl. 287—85 R **4 Claims**

A pivot or support sleeve has an elastomeric cushion and

consists of an inner metal tube or pin and two outer metallic

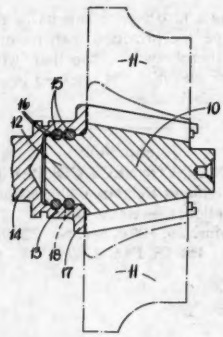


half shells between which is disposed a rubber layer vulcanized to the metal bodies with which it is concentric.

3,666,302
ROTOR ASSEMBLIES

Eric Kellett, London, England, assignor to C.A.V. Limited, Birmingham, England

Filed Nov. 2, 1970, Ser. No. 85,876
Claims priority, application Great Britain, Nov. 28, 1868, 58,221/68
Int. Cl. F16d 1/06
U.S. Cl. 287—53 R **2 Claims**



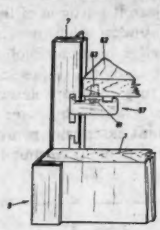
A rotor assembly comprising a metal shaft having a cup shaped portion at one end thereof, a rotor having a spigot portion for engagement with the cup shaped portion, groove means defined about one or both co-operating surfaces of said portions and a filling material occupying said groove means. The filling material is arranged to have a higher co-efficient of thermal expansion than that of the cup shaped portion of the shaft and is compressed into said groove means so as to interpose a compressive stress upon the spigot portion of the rotor.

3,666,303
DEVICE FOR JOINING TOGETHER PARTS OF A PIECE OF FURNITURE

Karl Huls, Schoppenkamp 29, 4424 Stadtlohn, Germany

Filed July 16, 1970, Ser. No. 55,533
Claims priority, application Germany, Sept. 25, 1969, P 19 48 400.5
Int. Cl. F16b 5/07
U.S. Cl. 287—20.92 C **16 Claims**

A device for securing together individual parts, such as wooden panels, of a piece of furniture is formed of an elongated U-shaped member which forms a groove within which a pair of strips are provided extending along the oppositely disposed legs or flanges of the U-shaped member. T-shaped recesses are formed in the edges of the strips located along the opening to the groove in the U-shaped member and connecting members are arranged to be interlocked into these recesses. One panel of the piece of furniture can be held between the strips within the groove in the U-shaped member

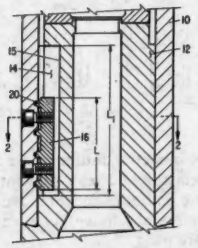


while additional parts or panels are attached to the members interlocked into the recesses in the strips.

3,666,304
SPLINE SYSTEM

Lawrence B. Wilder, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed July 21, 1971, Ser. No. 164,723
Int. Cl. F16d 1/06
U.S. Cl. 287—52.05 **6 Claims**

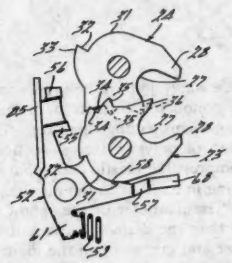


This invention relates to a spline arrangement for connecting a housing to an internal cylindrical member. A key member having a rectangular base is provided with anti-shear rings made integral with the base. Pockets are cut in the outer wall of the inner cylindrical member to receive the key member. Bolts extending through the housing wall pull the key member outwardly until the anti-shear rings enter mating circular grooves on the inside of the housing. Rotary torque can then be transmitted between the housing and the interior cylindrical member.

3,666,305
DOOR LATCH ASSEMBLY

William L. Schlichter, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 4, 1970, Ser. No. 95,221
Int. Cl. E05c 3/26
U.S. Cl. 292—48 **7 Claims**



A latch mechanism for a vehicle door having a pair of pivoted counterswinging latch elements adapted to be held in

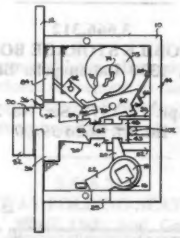
latched engagement with a striker pin by a detent means. Upon release of the detent means by a latch mechanism operator, the latch elements are free to move to an unlatched position permitting the vehicle door to be opened. The detent means is biased to be restored into engagement with the latch elements after release of the actuating means. Normally, under the biasing force, the detent means maintains an abutting relation to the peripheral surfaces of the respective latch elements and then moves further into latch element holding position as the latch elements encompass the striker. One of the latch elements is provided with an abutment on its peripheral surface positioned to engage a cam surface on a lever arm of the detent means to drive the latter into such latch element holding position in the event the normal biasing means becomes ineffective to do so for any reason.

3,666,306

LOCK WITH SAFETY BOLT

Joseph Michael Genakis, 948 West Boylston St., Worcester, Mass.

Filed Nov. 5, 1970, Ser. No. 87,147
Int. Cl. E05b *55/00*
U.S. Cl. 292—169.17 **2 Claims**



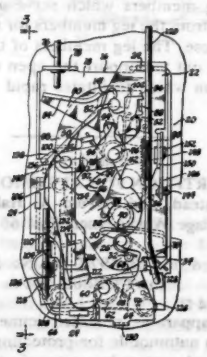
A key-operated lock having a locking bolt or tongue having a latch position and a bolt locked position, and including a locking plug with means for holding the locking plug in either tongue-locked or tongue-free condition; the locking tongue in bolt locked position extending to a greater than normal extent to present a flat flush surface to the door jamb to prevent retraction of the tongue by means of an instrument at the front of the door.

3,666,307

CLOSURE LATCH

Wieslaw S. Zaydel, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 2, 1970, Ser. No. 86,097
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 **4 Claims**



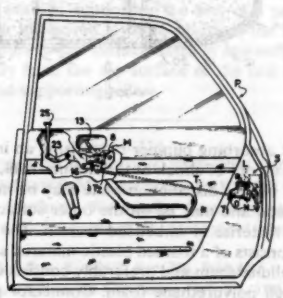
A vehicle body door lock includes an inverted fork bolt mounted on the lock frame for movement between latched and unlatched positions and primary and secondary detents mounted on the frame on generally diametrically opposite sides of the bolt pivot for movement between holding and released positions with respect to the bolt. Coaxially mounted with the primary detent is an operating lever which is connected to the outside push button through an intermediate push button lever. A generally J-shaped intermittent member is pivoted intermediate the ends thereof to a leg of the operating lever. The linear leg of the intermittent member mounts a tab movable between engaging and bypass positions with respect to a tab of a transfer link. One end of the link is pivoted to the secondary detent and the other end is engageable with the primary detent. The intermittent member is moved between unlocked and locked positions, respectively, corresponding to engaging and bypass positions of the intermittent member tab, by a locking lever coaxially mounted with the secondary detent and operable by a garnish button or key cylinder. The hook leg of the intermittent member includes a tab engageable by the primary detent to move the intermittent member from locked to unlocked positions upon movement of the detent by the bolt. If the outside push button is actuated prior to movement of the detent by the bolt the hook leg tab is moved out of the path of the primary detent. An inside remote handle is connected by a remote lever to the operating lever.

3,666,308

ACTUATING MECHANISM FOR A LATCH

Michel Bonnaud, Montbeliard, France, assignor to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France

Filed Sept. 11, 1970, Ser. No. 71,312
Claims priority, application France, Oct. 28, 1969, 6936996
Int. Cl. E05c *3/00*
U.S. Cl. 292—336.3 **7 Claims**



Actuating mechanism for a door latch which has a movable element assuming a latch closing position, a latch opening position and a latch locking position. A first control means controls the opening of the latch and a separate second control means controls the locking of the latch. A rocker element is operatively connected to each control means and to the movable element. A device is adapted to bring the rocker element to, and lock it in, a position in which the movable element is placed in the latch locking position when the second control means is brought to a latch locking position.

3,666,309

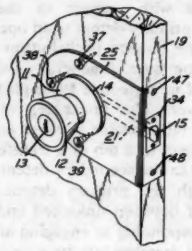
COVER FOR DOOR LOCK ASSEMBLY

Vincent F. Zarzycki, 9427 Kirkwood St., Philadelphia, Pa.

Filed Oct. 13, 1969, Ser. No. 865,766
Int. Cl. E05b *9/04*
U.S. Cl. 292—337 **3 Claims**

A cover for a door lock assembly having a knob assembly and a bolt assembly. The cover has a pair of side plates in-

tegral with a front plate and is formed of sheet material such as sheet steel. The cover is rigidly secured to the door and



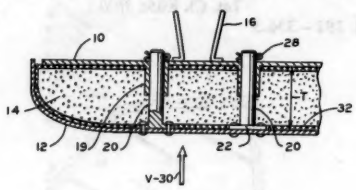
has an opening for receiving the bolt assembly and a pair of openings for receiving the knob assembly.

3,666,310

SHOCK ABSORBING BUMPER

Lester E. Burgess, Swarthmore, Pa.; Ignatius J. Niemkiewicz, Wilmington, Del.; Robert W. Cruger, Springfield, Pa., and Ronald J. Charno, Drexel Hill, Pa., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Jan. 11, 1971, Ser. No. 105,589
Int. Cl. B60r *19/06, 19/08*
U.S. Cl. 293—71 R 26 Claims



A shock absorbing bumper comprising an impact distribution plate, a core of shock absorbing material, and a backing plate. The impact distribution plate may be made of steel or a rigid plastic and may be on the outer surface of the shock absorbing material or imbedded therein. The shock absorbing core consists of a foamed plastic material such as a polyurethane cellular foam and preferably consists of a high density, tight cell polyurethane foam. Connector pins attach the impact distribution plate slidably into the backing plate so that the impact plate is supported by the backing plate against forces applied substantially parallel to the impact plate but will not directly transmit to the backing plate impact forces applied substantially perpendicularly to the impact plate. The bumper may be mounted with shock absorbing springs which deflect upon impact. The bumper may be formed with a projecting leading edge. Apertures may be provided in the backing plate to permit the escape of compressed gas from the foam.

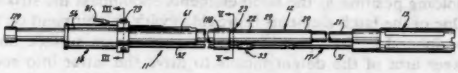
3,666,311

SHOTGUN STICK

Earl W. McMullin, Rutland Township, Barry County, Mich., assignor to Hastings Fiber Glass Products, Inc., Hastings, Mich.

Filed July 16, 1970, Ser. No. 55,372
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 R 18 Claims

A shotgun or clamp stick for applying devices, such as clamps, to electrical lines or conductors and removing devices therefrom. The stick includes an elongated support rod having an insulating head at one end and a movable actuating handle at the other end thereof. An operating rod extends from the handle and is slidably received within the insulating head. The operating rod is connected to a clamping mechanism which is slidably disposed within the head whereby actuation of the handle causes linear movement of the operating rod for causing a corresponding movement and



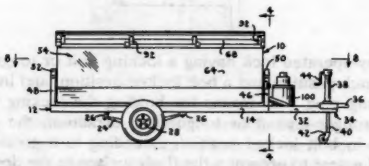
actuation of the clamping mechanism. The support rod and the operating rod are both of a telescopic construction. Releasable locking devices are provided for individually releasably fixedly locking together the telescoping parts of both the support rod and the operating rod. The support rod and the operating rod can be easily telescopically extended or shortened for permitting selective adjustment of the overall length of the clamp stick.

3,666,312

MOBILE STORAGE BOX

Richard T. Harris, 1330 Indianapolis Blvd., Lake County, Ind.

Filed Apr. 27, 1970, Ser. No. 32,164
Int. Cl. B62d *39/00*
U.S. Cl. 296—1 R 4 Claims



This application discloses a vehicularly movable trailer for storing an oil rake of the type used for containing pollutants in water such as an oil slick. The storage box body of this invention is pivotally supported on a drawbar frame for tilting toward either side. The top of the box is provided with hinged doors having vent means and a screened bottom which supports the stored oil rake. The cover doors are further provided with a plurality of hinged leg members which have extension members pivotally connected to distal ends of the leg members which serve as side posts when pivotally raised from the leg members for supporting sections of a skimmer hose. The leg members of the cover doors are pivotally swung out to support the open side of the door in platform position which facilitates rapid removal of the oil rake.

3,666,313

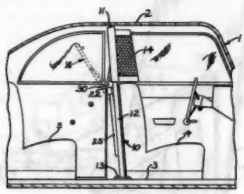
PARTITION FOR AUTOMOBILES

Robert E. Halstead, and Harold A. Halstead, both of c/o Novelty Carriage Works, Inc., East 6615 Main, Spokane, Wash.

Filed July 28, 1970, Ser. No. 58,857
Int. Cl. B60d *33/04*
U.S. Cl. 296—24 R 4 Claims

A partition apparatus mounted immediately behind the front seat of an automobile for protecting those in the front seat from physical contact by persons in the rear of the vehicle. It includes an inverted roll bar having a solid transverse plate extending across the back of the front seat. A movable

partition is selectively positioned in an upper location extending across the space between the roll bar and the top of the plate. It is movable to a lowered or retracted position by



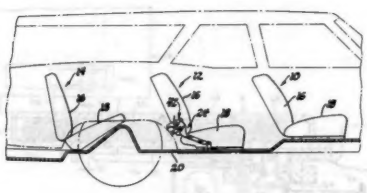
means of a pivot arm and lower slide connection, combining pivotal and translational movement to minimize projection of the partition rearward of the roll bar during movement of the partition. The partition is spring-biased to its upper position.

3,666,314

TWO-WAY FOLDING SEAT BACK

John P. Makinen, Royal Oak, and Gary A. Wize, Clair Shores, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 7, 1970, Ser. No. 95,712
Int. Cl. B60n *1/10*
U.S. Cl. 296—66 **3 Claims**



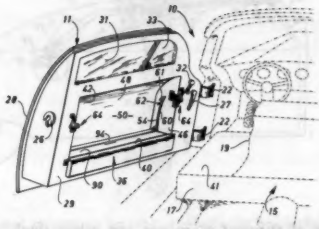
A seat assembly including a seat back and a seat cushion wherein the seat back is adapted to be folded forwardly about a first axis extending transversely to the longitudinal axis of the vehicle so as to overlie the seat cushion and provide a flat cargo platform and adapted to be folded forwardly relative to the seat cushion about a second axis which is angularly related to and intersects the first axis at a point located adjacent the aforementioned longitudinal axis so as to provide access space for a passenger entering the rear of the vehicle.

3,666,315

CONVERTIBLE SEAT-BED FOR AUTOMOBILES

Gerhard P. Reimann, 145 George St., Toronto, 2 Ontario, Canada

Filed Aug. 10, 1970, Ser. No. 62,580
Int. Cl. B60n *1/10*
U.S. Cl. 296—69 **12 Claims**



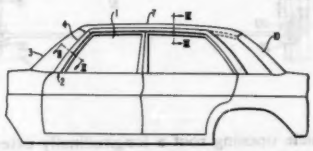
Recesses are provided within the doors of an automobile body structure to provide additional sleeping width for a person lying on a seat of the automobile. An intermediate sloping panel within each door separates the recess from an outwardly disposed window-receiving compartment. Usefully, arm rests which are adjustably mounted for movement between raised and lowered positions are provided. In their raised positions, the arm rests function as such while, in their lowered positions, they form extensions of the top surface of the seat portion of a seat of the automobile. Usefully, each arm rest can be adjusted into either of two lowered positions. In one such lowered position, the arm rest is disposed with its top surface parallel to but usefully slightly lower than the top surface of the seat for supporting the feet of a person lying on that seat. In its second lowered position, the arm rest is positioned so that its top surface extends upwardly and outwardly generally from the top surface of the seat to provide an inclined head-supporting pillow.

3,666,316

INSTALLATION FOR REDUCING THE SOILING OF SIDE WINDOWS OF A MOTOR VEHICLE

Karl Wilfert, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Oct. 8, 1969, Ser. No. 864,606
Claims priority, application Germany, Oct. 12, 1968, P 18 02 853.0
Int. Cl. B60j *1/20*
U.S. Cl. 296—84 C **19 Claims**



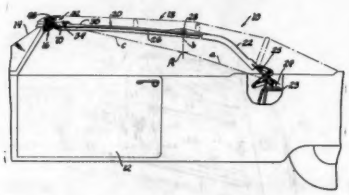
An installation for precluding the soiling of the side windows of a motor vehicle, especially of a passenger motor vehicle, in which a profiled molding is provided within the area of the column of the windshield which possesses a deflecting edge pointing in the driving direction.

3,666,317

SUPPORT MEMBERS FOR A CONVERTIBLE TOP

Stanley Podwys, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1970, Ser. No. 93,020
Int. Cl. B60j 7/18
U.S. Cl. 296—116 2 Claims



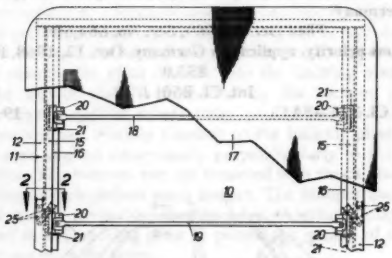
A pair of support members are respectively mounted on the forward ends of the front rail sections of an inwardly folding side rail type convertible top wherein the pivotal axes between the front and rear rail sections of each rail, between the convertible top header and the front rail section of each rail, and between a vehicle body mounted support panel and the rear rail section of each rail converge at respective points located short of infinity. When the top is in raised position, the support members extend forwardly from the front rail sections and are received between the convertible top header and the windshield header of the vehicle body. The support members are clamped between the headers by conventional convertible top latch mechanisms to support the pivotal connections between the front rail sections and the convertible top header thus rigidifying the rails.

3,666,318

OPENING ROOF FOR VEHICLES

James Butler, Kempsey, England, assignor to Weathershields Limited, Birmingham, England

Filed May 21, 1970, Ser. No. 39,474
Claims priority, application Great Britain, May 23, 1969, 26,338/69
Int. Cl. B60j 7/10
U.S. Cl. 296—137 C 8 Claims



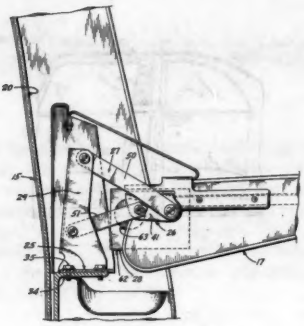
In a vehicle opening roof a longitudinally extending roof opening is adapted to be closed by a fabric covering fixed at its rear end to the roof and supported by a number of cross-members which are guided in guide flanges extending along each side of the opening. Releasable stop means incorporated for holding the covering in an intermediate open position are resiliently urged into engagement with a part of one cross-member to maintain the covering rearwardly of that cross-member in close contact with the roof.

3,666,319

POWER OPERATED ARMREST

Earle F. Moloney, Jr., 2309 Longacre Lane, Palatine, Ill.

Filed Aug. 21, 1970, Ser. No. 65,924
Int. Cl. A47c 7/54
U.S. Cl. 297—113 4 Claims



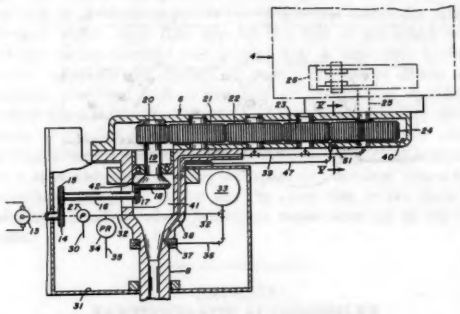
A power operated armrest for a vehicle seat having a seat back with a recess into and out of which the armrest moves between retracted and horizontally extended position, includes a hinge unit between the armrest and seat and a reversible motor coupled to the hinge unit to drive the armrest between retracted and extended positions.

3,666,320

LONGWALL MINING MACHINE

Willy Lanfermann, Bochum, Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Nov. 10, 1970, Ser. No. 88,371
Claims priority, application Germany, Dec. 11, 1969, P 19 62 019.0
Int. Cl. E21c 25/06
U.S. Cl. 299—53 3 Claims



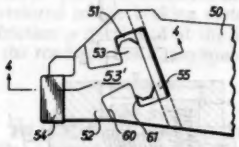
A longwall mining machine is described which has cutting rolls pivotally mounted about horizontal axes on a machine housing. The support arms enclose spur gears which are in engagement with each other and are adapted to transmit power from a drive motor in the machine housing to the cutting rolls at the free ends of the support arms. The two outermost spur gears in each arm form a gear pump which pumps the oil accumulating in the outer end of the support arm, when in a downwardly inclined position, back into an oil sump in the machine housing.

3,666,321

HOLDER FOR CUTTING TIP OF MILLING CUTTER MACHINE

Hans Per Olof Lundstrom, and Bernt Soren Liljekvist, both of Sandviken, Sweden, assignors to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

Filed July 30, 1970, Ser. No. 59,649
Claims priority, application Sweden, Mar. 24, 1970, 4011/70
Int. Cl. E21c 25/44
U.S. Cl. 299—93 3 Claims



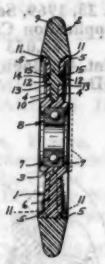
A carbide cutting tip is mounted in a separate cartridge which is removably secured in a rotary milling cutter head, so that break-down of the tip will not endanger damage to the cutter head but only the cartridge.

3,666,322

MOLDED PLASTIC WHEEL STRUCTURE

Roger R. Pickron, Roseau, Minn., assignor to Textron Inc., Providence, R.I.

Filed May 6, 1970, Ser. No. 35,031
Int. Cl. B60b 5/02
U.S. Cl. 301—63 PW 6 Claims



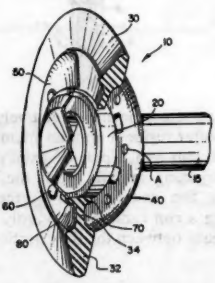
Molded wheel structure having a relatively hard rigid body and a relatively softer resilient annular member, the body including a tubular hub and a pair of axially spaced annular disk portions projecting radially from the hub and having smooth generally flat axially outer surfaces, the annular member including a rim radially outwardly of the disk portions and wall means between the disk portions.

CHEMICAL

3,666,323
WHEEL CONSTRUCTION

Laurent Beaudoin and Sarto Richer, Valcourt, Quebec, Canada, assignors to Bombardier Limited, Valcourt, Quebec, Canada

Filed Dec. 23, 1969, Ser. No. 887,630
Claims priority, application Canada, Aug. 20, 1969, 60,053
Int. Cl. B60b *3/08*
U.S. Cl. 301—63 DD 6 Claims

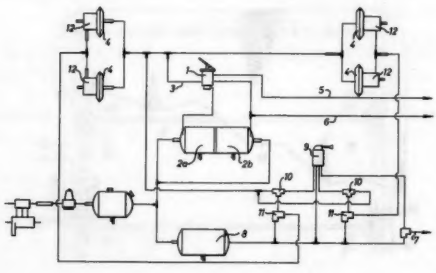


An improved bogie wheel in which the rubber tire is positively secured to the flanges by means of axially extending integral lugs that cooperate with corresponding formations or the inner faces of the flanges.

3,666,324
VEHICLE BRAKING SYSTEMS

Wilbur M. Page, Bracebridge Heath, and Ralph Coupland, Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England

Filed Dec. 8, 1969, Ser. No. 883,209
Claims priority, application Great Britain, Dec. 6, 1968, 58,092/68
Int. Cl. B60t *13/26*
U.S. Cl. 303—9 7 Claims

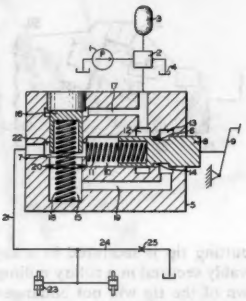


A vehicle braking system for tractor-trailer combinations and which includes air pressure-operated brake units and spring-actuated, air pressure-released brake units comprises a manually-operable control unit incorporating two graduated pressure valves controlling respectively the application of the spring brake units and the auxiliary line to the trailer brakes, and an "on-off" valve for venting all air lines to all brake units.

3,666,325
BRAKE CONTROL APPARATUS

Johannes Altmeppen, Empelde, Germany, assignor to Westinghouse Bremsen-und Apparatebau G.m.b.H., Hannover, Germany

Filed Dec. 16, 1970, Ser. No. 98,569
Int. Cl. B60t *13/16*
U.S. Cl. 303—10 5 Claims

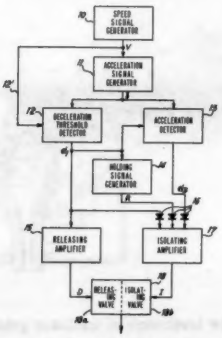


The invention relates to an actuating system for a hydraulic servo brake installation to be used in a motor vehicle, more specifically a truck, possessing a brake valve located between a pressure source and the brake cylinders, which controls the flow of brake fluid continuously during the act of braking, this valve being equipped with two adjustable throttles connected in series.

3,666,326
ANTI-SKID DEVICE FOR A VEHICLE BRAKING SYSTEM

Guy Marouby, Neuilly, France, assignor to Societe Anonyme D.B.A., Clichy, France

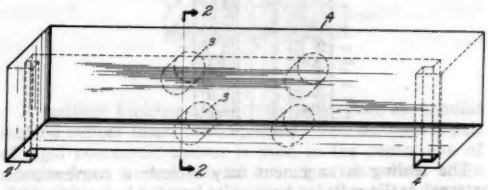
Filed Aug. 5, 1970, Ser. No. 62,240
Claims priority, application France, Sept. 25, 1969, 6932719
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 BE 6 Claims



An anti-skid device for a vehicle braking system having an electronic sensing unit selectively controlling the operation of an actuating unit formed of two components. Once the braking pressure has been aplied to the braking system, one of the components is selectively activated to isolate the brake pedal from the braking system between one instant corresponding to a predetermined threshold of

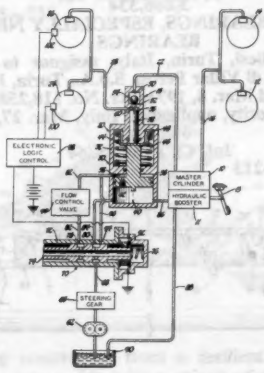
wheel deceleration and another instant corresponding to the peak value of the wheel acceleration which follows the wheel deceleration while the other component is selectively activated to progressively release the pressure in the braking system to a certain value between said one instant corresponding to said predetermined threshold of wheel deceleration and still another instant corresponding to a second predetermined threshold of wheel deceleration which is closed to the point of zero deceleration (or acceleration), the pressure in the isolated braking system being maintained to the said value until the instant corresponding to the peak value of the wheel acceleration which follows the wheel deceleration. In other words, the pressure is restored in the braking system when the coefficient of friction μ developed at the interface between the tire and the road reaches a maximum value.

3,666,327
TRACK SHOE PROTECTOR
Luis Padilla, Apartado 10–91, Managua, Nicaragua
Filed July 1, 1970, Ser. No. 51,623
Int. Cl. B62d *55/56*
U.S. Cl. 305—35 R **2 Claims**



A rubber, plastic or like block of material having integrally formed attachment lugs formed at its opposite ends for securing the block to the respective track shoes of the endless tracks of tractors and earth moving equipment to protect the roadways, display room floors, and the like over which the vehicles are driven. The underface of the block is provided with openings for housing the projecting bolt heads of the track shoes.

3,666,328
WHEEL ANTI-LOCK CONTROL SYSTEM
John R. Williams, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 9, 1970, Ser. No. 79,474
Int. Cl. B60t *8/02*
U.S. Cl. 303—21 F **4 Claims**

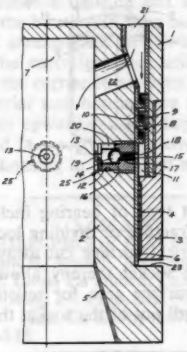


A wheel anti-lock control system wherein the size of the modulator piston supporting spring is minimized by providing a hydraulic piston supporting pressure consisting of the back-pressure created by an open center hydraulic brake booster.

ERRATUM

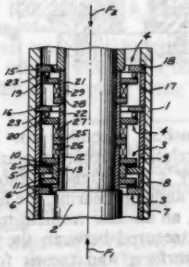
For Class 305—35 R see:
Patent No. 3,666,327

3,666,329
METHOD OF AND MEANS FOR LUBRICATING THE LOWER BEARINGS IN A DRILLING MACHINE
Jean Bell, La Tronche, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Grenoble, France
Filed Jan. 11, 1971, Ser. No. 105,308
Claims priority, application France, Jan. 16, 1970, 7001680
Int. Cl. E21b *9/08*
U.S. Cl. 308—8.2 **7 Claims**



Located between the lower drill bearing and a lubricant flow control joint in the lubricant flow passage to such bearing is a calibrated valve constructed to permit flow of lubricant directly from the bore of the turbine shaft to such flow passage when the lubricant pressure at the drilling bit is insufficient to effect adequate lubrication of the lower bearing.

3,666,330
THRUST BEARING ARRANGEMENT FOR TURBO-DRILLS
Leonide Dicky, Grenoble, France, assignor to Societe Generale de Construction Electriques et Mecaniques (ALSTHOM), Grenoble, France
Filed Oct. 20, 1970, Ser. No. 82,437
Int. Cl. F16c *21/00, 17/04, 19/10*
U.S. Cl. 308—35 **6 Claims**



The disclosed layout of thrust bearing for a turbo-drill includes a single acting sliding thrust bearing arranged

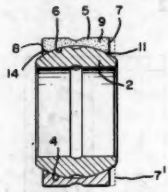
to transmit only those axial loads on the drive shaft which are directed toward the drilling bit, and a single acting roller thrust bearing capable of working in the mud flush and arranged to transmit only those axial loads on the drive shaft which are directed away from the drilling bit. This selective transmission of the axial loads is accomplished by the use of longitudinal absorbers between the drive shaft and the sliding and roller thrust bearings.

3,666,331

BALL AND SOCKET BEARING

Earl M. Curtis, Torrington, Conn., and Roger E. Pardon, Naperville, Ill., assignors to The Torrington Company, Torrington, Conn.

Filed Oct. 27, 1970, Ser. No. 84,340
Int. Cl. F16c *23/04*
U.S. Cl. 308—72 **3 Claims**



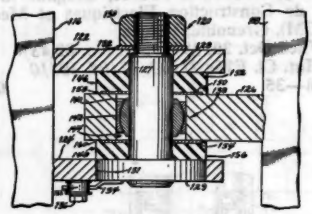
A ball and socket type of bearing including a socket containing a single fracture or dividing location and having its internal spherical surface cut away adjacent only one end face of the socket thereby allowing the socket to provide a large surface area for resisting axial loads acting to force the ball out of the socket through its other end face.

3,666,332

SELF-ALIGNING THRUST BUSHING ASSEMBLY

Keith W. Kampert, Libertyville, and Kenneth E. Houtz, Streamwood, Ill., assignors to International Harvester Company, Chicago, Ill.

Original application July 1, 1966, Ser. No. 562,266, now Patent No. 3,434,766, dated Mar. 25, 1969. Divided and this application Aug. 26, 1968, Ser. No. 778,878
Int. Cl. F16c *17/06*
U.S. Cl. 308—135 **5 Claims**



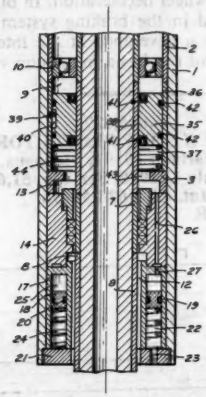
A self-aligning bushing assembly for carrying axial loads between two relatively rotating plane surfaces secured for rotation by a pin extending through openings in the surfaces. An annular bearing member positioned adjacent one surface, an annular resilient member of elastomeric composition secured between the bearing member and the other surface, and means for moving the surfaces toward each other to facilitate adjustment upon assembly and thereafter to compensate for wear.

3,666,333

SEALING ARRANGEMENT FOR THE CASINGS OF UNDERGROUND MOTORS

Leonide Dicky, Grenoble, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), Grenoble, France

Continuation-in-part of application Ser. No. 50,200, June 26, 1970. This application Oct. 13, 1970, Ser. No. 80,345
Claims priority, application France, June 30, 1969, 6921907
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.1 **10 Claims**



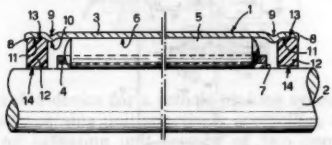
The sealing arrangement may include a conventional external sealing device having its interior in contact with the lubricant filling the bearing chamber of the motor of an underground drilling machine, a space isolated from the outer environment by a second seal and filled with a protective product under a slightly greater pressure than that of the outer enironment. The pressure on the protective product is effected by a casing fitted with a piston, one side of the space defined by the piston constitutes a part of the space filled with the protective product, and the space on the other side of the piston being in communication with the bore hole and containing a spring acting on the piston. Instead of a conventional sealing device, there may be used a sealing device capable of pressuring the lubricant so that it is placed under a slightly greater pressure than the protective product, thereby preventing possible contamination of the lubricant by the protective product.

3,666,334

ROLLER BEARINGS, ESPECIALLY NEEDLE BEARINGS

Dino Senigalliesi, Turin, Italy, assignor to Riv-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Mar. 8, 1971, Ser. No. 118,258
Claims priority, application Italy, Mar. 27, 1970, 68,042/70
Int. Cl. F16c *33/64*
U.S. Cl. 308—213 **8 Claims**



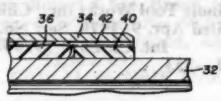
A roller bearing, and particularly a needle roller bearing having a cylindrical outer casing which has a substantially constant wall thickness throughout its length. Within the

outer casing run roller bodies or needle roller bodies and these are located in positions spaced around the inside of the casing by a cage having a pocket for each roller. At each end of the outer casing there is a surface irregularity which may be a circumferential groove or a circumferential ridge, each having radial depth or height. Annular end members adapted to be located and held by the surface irregularities close off the ends of the outer casing and hold the roller cage in place.

3,666,335
HEAVY-DUTY RESILIENT ELASTOMERIC BUSHING

Arthur Mundy, Lucerne, and David L. Sievers, Logansport, Ind., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Aug. 10, 1970, Ser. No. 62,464
Int. Cl. F16c *33/22, 27/06;* F16f *1/38*
U.S. Cl. 308—238 **9 Claims**

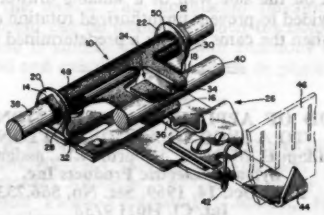


A resilient bushing of the type comprising an annular molded rubber insert radially compressed between a pair of rigid concentric sleeves is used in the center eye of a beam for a tandem axle of a truck or elsewhere where the bushing is subjected to torsional and radial deflection as well as conical motion. The conical motion causes the ends of the outer sleeve to rub and abrade the rubber insert, resulting in premature failure of the bushing. The fatigue life of the bushing can be substantially increased by replacing a portion of the insert, at each end of the bushing, with a wear-resistant ring made from a material such as cast urethane. The two rings typically grip the inner sleeve and are sufficiently thin so that the outer sleeve does not contact them when the bushing is loaded statically in the radial direction. However, they are thick enough to limit the conical movement of the sleeves.

3,666,336
BEARING

Lester R. Leidy, Jr., Oreland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 18, 1970, Ser. No. 64,753
Int. Cl. F16c *33/20*
U.S. Cl. 308—238 **8 Claims**

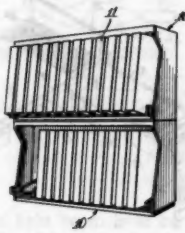


A bearing constructed from a resilient sheet having flap portions engageable with portions of a bearing support to retain convoluted parts of the bearing that are loosely mounted on the support from being rotated or moved in a horizontal direction along the support.

3,666,337
CARTRIDGE HOLDER

Stanley J. Sztorc, Westchester, Ill., assignor to National Creative Merchandising Corp.

Filed Aug. 26, 1970, Ser. No. 66,996
Int. Cl. F16b *12/00*
U.S. Cl. 312—111 **16 Claims**

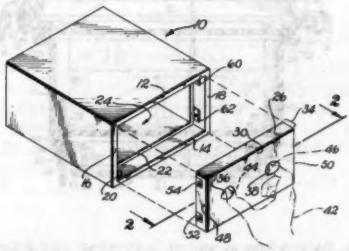


A holder for selectively storing and presenting a plurality of cartridges, such as cassette cartridges and the like. The holder includes a housing and a carrier removably associated with the housing to store cartridges in the housing in a closed arrangement of the holder and to selectively present the cartridges for facilitated removal and placement itno the carrier in an open arrangement of the holder. The carrier and housing are arranged to dispose the carrier in an upwardly tilted disposition in the open arrangement and in a position effectively closing the front opening of the housing in the closed arrangement.

3,666,338
CHILD-PROOF CONTAINER

Ronald R. Russell, Southgate, Calif. (311 N. Lime, La Habra, Calif. 90630)

Filed Aug. 17, 1970, Ser. No. 64,541
Int. Cl. E05b; A47b
U.S. Cl. 312—215 **8 Claims**



A lid or drawer is close-fit within the opening of a receptacle and is removable only by pulling the lid or drawer directly out of the opening, against the tension of spring loaded catches, by means of a pair of finger grips which are spaced apart a distance greater than the effective finger grip span of a child and less than the finger grip span of an adult. The structure is adapted to a cabinet wall and door by connecting one edge of the door to the cabinet wall with a hinge which is pivotal in a plane normal to the plane along which it opens.

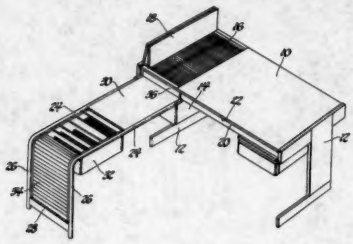
3,666,339
DESK ARRANGEMENT

John W. Neufeld, Mississauga, Ontario, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada

Filed Sept. 14, 1970, Ser. No. 71,811
Int. Cl. A47b *17/00*
U.S. Cl. 312—277 **4 Claims**

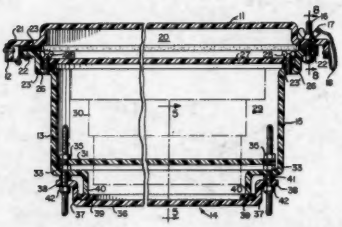
A clip-on attachment for a metal desk having a depending rail at its front edge with a horizontal groove

near the top has a pair of metal tubes extending horizontally and bent downwardly to the floor at the end remote from the desk top. A sheet metal top joins the tubes and extends vertically and horizontally to engage the groove at the edge of the main desk. Each tube at its



end carries a clamping hook extending underneath and upwardly inside the rail. The tubes may support an open top filing tray and a tambour cover is slidable along the tubes from a position over the tray to a stowed position along the vertical portions of the tubes.

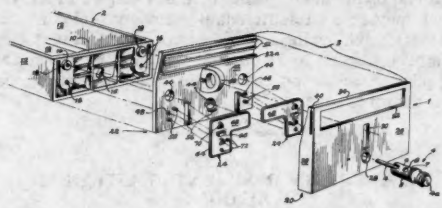
3,666,340
INSULATED AIR-TIGHT CONTAINER FOR INSTRUMENTS
Joseph D. Albeanese III, 4409 Lake Villa Drive, Metairie, La. 70002
Filed July 1, 1970, Ser. No. 51,489
Int. Cl. A47b *81/00*
U.S. Cl. 312—283 **5 Claims**



An insulated, air-tight container designed specifically for housing instruments, such as meters, gauges, etc., which are employed in an environment where such instruments would normally be exposed to detrimental atmospheric effects causing corrosion, etc., of the working parts of such instruments.

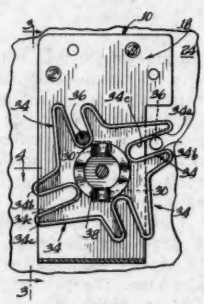
3,666,341
DRAWER FRONT CONSTRUCTION
Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.
Filed Nov. 13, 1970, Ser. No. 89,312
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 **6 Claims**

A two-part plastic front construction for library card drawers or the like, wherein a rear half of the front carries a tray pull or handle for projection forwardly through an opening in a forward half of the front. The front is mounted on and force applied to the tray pull transferred to the card tray body by metal reinforcing brackets positioned between the halves prior to assembly thereof. The halves are provided with aligned openings to receive a card follower or holding rod mounting latch device retained therein by by a guide-retainer formed



integrally with and projecting rearwardly from the rear half.

3,666,342
OVER-CENTER LOCKING DEVICE
Donald Leslie Biesecker, Centerville, Ohio, assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Apr. 9, 1970, Ser. No. 27,063
Int. Cl. E05c *19/06*
U.S. Cl. 312—333 **5 Claims**

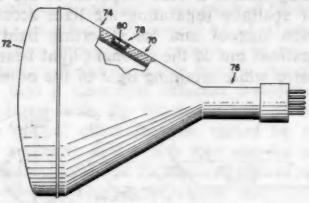


The present invention relates generally to a restraining device for preventing the unauthorized or inadvertent shifting of a horizontally slidable member and more particularly to a restraining device for use with slidable structures such as the baskets or drawers in refrigerators and the like. One embodiment of the present invention as disclosed herein comprises a support attachable to the vertical panel of a refrigerator and a rotary latch member mounted on the support. The rotary latch member includes a plurality of peripheral, equally spaced cams each of which comprise a pair of spaced cam surfaces defining a recess opening radially outwardly for accommodating a complementary shiftable cam actuating member such as a pin mounted on the side wall of a slidable drawer. Means is also provided to prevent unauthorized rotation of the latch means when the cams occupy a predetermined position.

3,666,343
METHOD OF APPLYING A RADIATION SHIELD TO A SECOND ANODE BUTTON
William H. McNeill, Auburn, N.Y., assignor to Sylvania Electric Products Inc.
Filed Oct. 14, 1969, Ser. No. 866,233
Int. Cl. H01j *9/38*
U.S. Cl. 316—20 **2 Claims**

A substantially hollow anode button formed for sealing in a glass wall of a cathode ray tube envelope has a radiation shield affixed to its bottom surface of a size compatible with an aperture in its upper surface. The shield can be affixed before the button is sealed in the wall and in one method comprises the salvage area of a

formed washer which comprises a portion of the upper surface of the button. In a second method the shield is



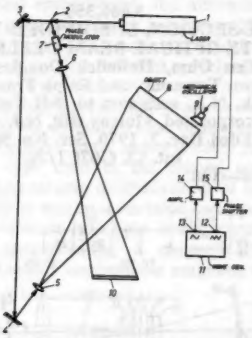
applied as a molten metal; e.g., lead, after a tube has been exhausted and sealed.

3,666,344

TIME-AVERAGE HOLOGRAPHY WITH A MODULATED REFERENCE BEAM

Francois Mottier, Zurich, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Aug. 4, 1970, Ser. No. 60,800
Claims priority, application Switzerland, Aug. 27, 1969, 12,972/69
Int. Cl. G01n *21/46*; G02b *27/00*
U.S. Cl. 350—3.5 **6 Claims**



A method is provided for holographic analysis of a vibrating object which comprises the steps of producing from one and the same monochromatic coherent light source an illuminating beam which illuminates the object and a reference beam which interferes on a holographic plate with object-light scattered by the object. The reference beam is phase-modulated with a modulation function which differs from the object vibration function for the purpose of reducing large differences in intensity as between the nodal-lines and the iso-amplitude lines appearing in the reconstructed hologram, and for providing information as to the phase relationship between vibrating points of the object. The modulation function of the reference beam can be triangular when the object vibration function is sinusoidal, and both functions have the same period and can either be in phase or phase shifted.

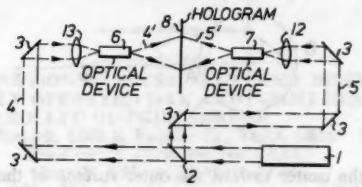
3,666,345

COUPLING DEVICE IN MODULATED COHERENT LIGHT TRANSMISSION SYSTEM

Stefan Maslowski, Aufheim, Neu-Ulm, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 15, 1970, Ser. No. 72,448
Claims priority, application Germany, Sept. 20, 1969, P 19 47 719.1
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **17 Claims**

For coupling two optical devices together in series for the transmission of a coherent, modulated light beam, a hologram is formed by the interference of a coherent wave with the light produced by transmitting the same coherent wave in the reverse direction through the optical



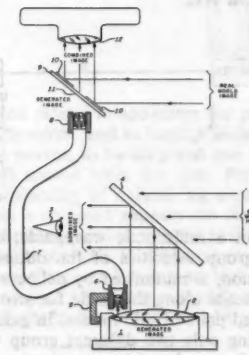
device to which the light beam is to be transmitted and such hologram is placed between the two optical devices which are to be coupled.

3,666,346

HEADSUP DISPLAY WITH REMOTE RECORDER

William J. Lucas, Phoenix, Ariz., assignor to Sperry Rand Corporation

Filed Sept. 28, 1970, Ser. No. 76,114
Int. Cl. G02b *23/10, 27/10*
U.S. Cl. 350—19 **5 Claims**



An electrically generated image is collimated, and, by means of a fiber optic bundle, transmitted to a combining means. A real world image, which is assumed to be collimated, is also presented to the combining means. The combining means comprises an apertured mirror whereby the two images are combined by reflecting and transmitting apertures. The combined image may be recorded directly on film at an immediate or at a remote location.

3,666,347

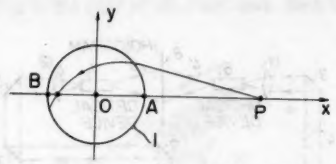
SPHERICAL LENS STRUCTURES

Ichiro Kitano, Kobe, and Hiroyoshi Matsumura, Ashiya, Japan, assignors to Nippon Selfoc Kabushiki Kaisha (also known as Nippon Selfoc Co. Ltd.), Tokyo-to, Japan

Filed Mar. 10, 1970, Ser. No. 18,223
Claims priority, application Japan, Mar. 17, 1969, 44/20,190
Int. Cl. G02b *1/00, 3/00, 5/16*
U.S. Cl. 350—96 B **5 Claims**

A glass sphere containing thallium and sodium cations is immersed in a bath of a molten salt containing at least one kind of metal cations such as potassium cations to

cause ion exchange through the glass-salt contact surface in a manner such that the concentrations of the cations, which constitute modifying oxides within the glass, vary



from the center toward the outer surface of the sphere, which thereupon becomes a spherical lens with a refractive index n representable by

$$n = n_0\left(\frac{1}{1+(r/a)^2}\right)$$

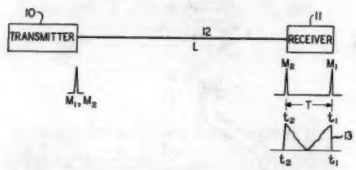
wherein n is the refractive index at a radial distance r from the center, n_0 is the refractive index at the center, a is a positive constant, and (r/a) is less than one (unity).

3,666,348

MULTIMODE WAVEGUIDE

Enrique Alfredo Jose Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 25, 1970, Ser. No. 75,616
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG **11 Claims**



Dispersion in a multimode waveguide, due to differences in the group velocities of the different modes of wave propagation, is minimized by deliberately introducing coupling means along the guide for strongly coupling between selected pairs of said modes. In guides supportive of modes having only two different group velocities, the coupling, which can be either continuous or at longitudinally spaced intervals along the guide, has a spacial periodicity equal to the beat wavelength between the different modes. In guides supportive of modes having three or more different group velocities, the guide is proportioned such that the average group velocities of selected pairs of guided modes are approximately equal to the same means velocity, and the coupling mechanism has a spacial distribution given by the superposition of sinusoids whose periodicities are equal to the beat wavelengths between the selected pairs of modes.

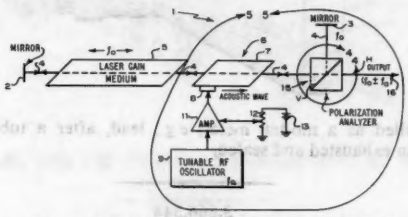
3,666,349

OPTICAL RESONATOR HAVING ACOUSTO-OPTIC OUTPUT COUPLING MEANS

Laurence M. Hubby, Jr., 555 Middlefield Road, Apt. P104, Mountain View, Calif. 94040

Filed Aug. 7, 1970, Ser. No. 61,948
Int. Cl. G02f 1/24
U.S. Cl. 350—149 **11 Claims**

Devices employing optical resonators having a path for a resonant light beam are disclosed. An acousto-optic light filter is disposed in the resonant light path of the resonator for collinearly diffracting the light beam on the acoustic wave to shift the polarization of at least some of the resonant light within the optical bandpass of the filter from a first polarization to a second polarization. A polarization analyzing means is also disposed in the resonant light path for spatially separating the light according to the polarization thereof and for diverting light of one of the polarizations out of the resonant light beam of the optical resonator while retaining light of the other polari-



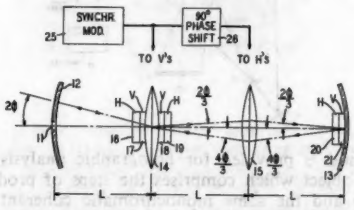
zation in the resonant light beam. The frequency of the light coupled out of the optical resonator may be varied by varying the frequency of the acoustic wave in the acousto-optic filter, whereas the amount of light coupled out of the resonator may be varied by varying the power density of the acoustic wave within the acousto-optic element.

3,666,350

MULTIPLE-SECTION, SUBDIVIDED TWO-COORDINATE OPTICAL BEAM DEFLECTORS

Edward Allen Ohm, Holmdel, Douglas Harned Ring, Middletown Township, and Ralph Francis Trambarulo, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 7, 1970, Ser. No. 95,570
Int. Cl. G02f 1/20
U.S. Cl. 350—150 **15 Claims**



There is disclosed an apparatus for deflecting an optical beam in which electro-optic beam deflection is obtained in a multiple-section arrangement in which the deflection capability is split among several different sections which are sections of a beam waveguide, which can be made multiple-pass by end reflectors. The deflecting crystals are placed relatively near predicted beam-crossovers of the axis of the apparatus. The number of sections and their included deflecting crystals for each coordinate can be increased to a number providing either a practical length of the deflecting material with tolerable temperature rise or a reduction in the total drive power required.

3,666,351

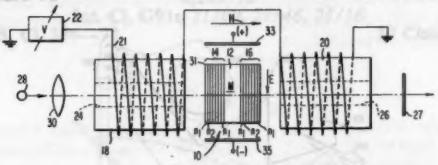
CONTROLLABLE MAGNETOOPTICAL DEVICES EMPLOYING MAGNETICALLY ORDERED MATERIALS

Yoh-Han Pao, Cleveland Heights, Ohio, assignor to The Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of application Ser. No. 746,902, July 23, 1968. This application Nov. 6, 1969, Ser. No. 874,431
Int. Cl. G02f 1/22
U.S. Cl. 350—151 **27 Claims**

A magnetically tunable interference filter including magnetically ordered material and multiple layers for

effecting optical interference. Tuning is achieved by causing a change in the index of refraction in the magnetically ordered material. In one embodiments, a magnetically ordered film is sandwiched between two high reflectance mirrors each consisting of alternate films of high and low indices of refraction. The net macroscopic magnetization of the magnetic layer is varied to tune the filter so that it transmits different wavelengths of light in accordance with the magnetization of the film. The magneto optical effect may be varied by means of an external magnetic field which may also be supplemented by an electric field for further control of the magneto-optical effect. (This embodiment may be used as a bidirectional light director.) In a second embodiment, a tunable reflectance filter is formed by alternate films of



magnetically ordered and dielectric materials. In a variation of the second embodiment, the alternate films are both of ordered magnetic nature but have different magnetic properties. An external magnetic field is applied to the filter to tune it so that different wavelengths of light are reflected from the filter. Two or more of the filters of the first or second embodiment may be combined in tandem to expand the dynamic range of tuning. In a third embodiment, a dielectric layer is sandwiched between two mirrors of the type used in the second embodiment. When the net macroscopic magnetization of such a filter is changed, the filter acts as a variable band pass filter.

Another embodiment is a light beam scanning or deflecting device incorporating a magnetically ordered medium responsive to a controllable magnetic field.

3,666,352

RATE CONTROLLED PHOTOCHROMIC LENSES OF VINYL CHLORIDE-VINYL ACETATE COPOLYMER CONTAINING A MERCURY THIOCARBAZONE COMPOUND

Charles A. Wagner, Towson, Md. (32 Virginia Ave., Shrewsbury, Pa. 17361), and Herman B. Wagner, Triangle Hill, Box 22, R.D. 1, Perkasie, Pa. 18944

No Drawing. Continuation-in-part of application Ser. No. 474,956, July 26, 1965. This application Jan. 22, 1970, Ser. No. 5,095

Int. Cl. G02c *7/10;* **G02b** *5/20;* **F21v** *9/00*

U.S. Cl. 350—160 **8 Claims**

Mercury thiocarbazone compounds dispersed in a solidified plasticized resin composition consisting essentially of vinyl chloride copolymerized with, e.g., not less than 5 mol percent of vinyl acetate and laminated in a sandwich between two transparent glass or plastic layers provide lenses with extremely rapid color responses to incident light and reversion to dark-adapted states.

3,666,353

DISPLAY SYSTEM INCLUDING STANDBY RETICLE MEANS

Arthur Sussman, Jersey City, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Feb. 11. 1971. Ser. No. 114,556

Int. Cl. G02b *27/14, 5/16;* **H01j** *29/89*

U.S. Cl. 350—174 **8 Claims**

A head-up display system includes a cathode ray tube and means for projecting electronically generated information displayed on the tube to an observer. Upon failure of the tube a standby reticle containing some of the basic information normally displayed is positioned in the field of view and projected to the observer through the same projection means. The system features the use of fiber optics for providing increased accuracy and brightness with minimal space, weight and power requirements.

3,666,354

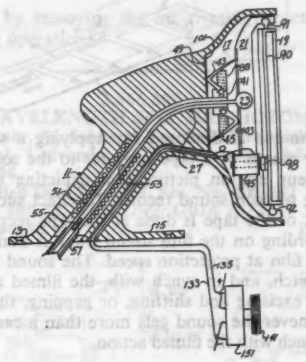
COMBINATION ELECTRICALLY AND MECHANICALLY OPERATED DAY AND NIGHT REMOTE CONTROLLED OUTSIDE MIRROR

Carl D. Russell, 1502 S. Boulder St., Tulsa, Okla. 74119

Filed Oct. 5, 1970, Ser. No. 78,011

Int. Cl. B60r *1/06;* **G02b** *7/18*

U.S. Cl. 350—281 **7 Claims**



This invention relates to apparatus for positioning and locking a vehicle mirror and its backing. A housing pivotally supports the mirror, its backing and case therefore, and includes a wall spaced from the case. Pivotal means in the form of a plurality of angular leg elements pivotally supported from a common support are disposed between the wall and the case for changing the position of the mirror case relative to the wall. Resilient means normally urge the case against the pivotal means to lock the mirror in set viewing position. Electromagnetic coils and a bar magnet lock the mirror in either day or night position.

3,666,355

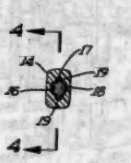
EYEGLASS TEMPLE

Arthur G. Griffith, 1920 Drew Ave. S., Minneapolis, Minn. 55416

Filed Feb. 16, 1971, Ser. No. 115,168

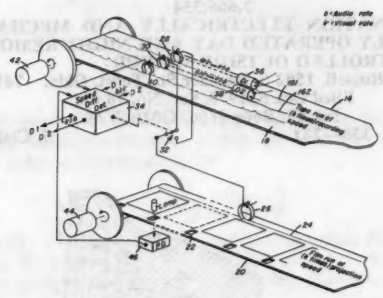
Int. Cl. G02c *5/20*

U.S. Cl. 351—118 **2 Claims**



An eyeglass temple that has an ear piece that is longitudinally slidable in the portion of the temple that is secured to the lens supporting structure and is spring loaded by a tension that exerts its pull in a line along the longitudinal center of the temple body portion. The ear-piece is an out of round shape and fits a similarly shaped but slightly larger cavity in the temple body portion so that the ear piece will not rotate.

3,666,356
SOUND MOVIES AND METHODS OF MAKING SAME
Franklin C. Williams, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,226
Int. Cl. G03b *31/02*
U.S. Cl. 352—5 **4 Claims**

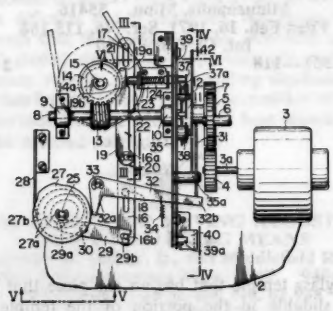


A technique is disclosed for applying a sound record made by means of a tape recorder to the sound track of an amateur motion picture film depicting action corresponding to such sound record. To effect such technique, playback of the tape is done at the tape recording speed; and recording on the film sound track is done while running the film at projection speed. The sound track is kept at true pitch, and in synch with, the filmed action by selectively excising and shifting, or gapping, the sound record whenever the sound gets more than a certain amount out of synch with the filmed action.

ERRATUM

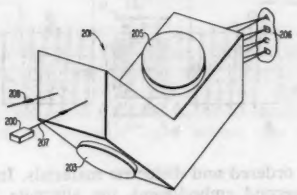
For Class 352—78 C see:
Patent No. 3,666,361

3,666,357
DEVICE FOR SELECTIVELY SWITCHING-OVER THE SPEED OF FEEDING FILM IN MOTION PICTURE PROJECTOR
Tadao Hayami, Tokyo, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed Mar. 2, 1970, Ser. No. 15,425
Claims priority, application Japan, Mar. 17, 1969, 44/20,250
Int. Cl. G03b *21/48*
U.S. Cl. 352—180 **3 Claims**



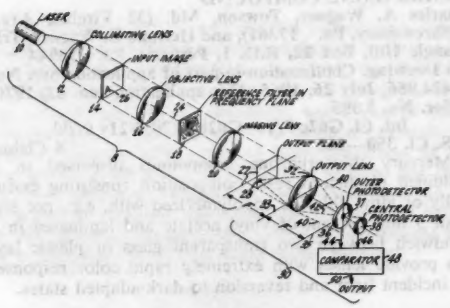
A device for selectively switching-over the speed of feeding film by effecting cyclic movement of a claw member in a motion picture projector has an intermediate lever associated with the claw member having first and second cam faces at one side and a third cam face at the other side, and pivotably attached to a coupling member manually operable for setting at three positions, namely, standard projection, slow-motion projection and stop-motion projection, and also a filter member associated with the coupling member, urged in one direction away from the light path leading to the film, so that the filter member is moved away from the light path only when the coupling member is brought into the position of the stop-motion projection.

3,666,358
REFLEX CHARACTER GENERATOR
Willard K. Banks, Cupertino, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 3, 1969, Ser. No. 881,807
Int. Cl. G03b *23/02;* **G02f** *1/28, 1/36*
U.S. Cl. 353—25 **14 Claims**



A reflex character generator comprising a light source positioned to input a light beam to a light deflector, such as a switchable total internal reflection (STIR) light deflector, at such an angle that upon reflection from a reflective character mask located after the light deflector, the reflected light beam in character form will re-enter and then exit the light deflector on a single path separate from the incoming light beam.

3,666,359
CORRELATION PEAK DETECTOR IN OPTICAL SPATIAL FILTERING SYSTEM
Walter Wright Lee, Allendale, N.J., assignor to RCA Corporation
Filed Aug. 26, 1970, Ser. No. 66,966
Int. Cl. G06k *9/08;* **G01h** *21/00;* **G01j** *1/42*
U.S. Cl. 356—71 **1 Claim**



A means is disclosed to detect a bright spot correlation peak at any position in an output plane of a double diffractometer optical correlator in which an input image is randomly located in an input plane. A lens is positioned a distance equal to its focal length F from the output plane. A central photodetector and a concentric outer photodetector are positioned at the distance F from the lens. The photodetectors are constructed so that the outer photodetector produces a larger electrical output signal when both photodetectors are uniformly illuminated. A bright spot correlation peak at any location in the output plane

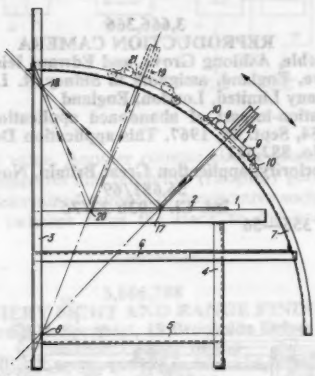
uniformly illuminates both of the concentric photodetectors, and a general or diffuse illumination in the output plane illuminates solely the central photodetector. A comparator receptive to electrical signals from the photodetectors provides a "match" output when the signal from the outer photodetector is larger than the signal from the central photodetector.

3,666,360

METHOD AND APPARATUS FOR INSPECTING A GLASS SURFACE

Harry Mills and Leslie Woods, Lancashire, England, assignors to Pilkington Brothers Limited, Liverpool, England

Filed Feb. 5, 1971, Ser. No. 112,961
Claims priority, application Great Britain, Feb. 2, 1970, 6,149/70
Int. Cl. G01n *21/00, 21/48, 21/16*
U.S. Cl. 356—72 10 Claims



A glass surface is inspected for defects, especially sleeks, by directing a beam of light to illuminate an area of the glass surface and to produce by reflection a beam of light passing through a stationary position above the glass surface, and traversing the incident beam about an axis disposed at the position below the glass surface of the imaginary mirror image of the said stationary position above the glass and extending parallel to the glass surface and perpendicular to the incident beam, whereby the illuminated area moves over the glass surface whilst the main reflected beam continues to pass through said stationary position. Said illuminated area is then observed from a position adjacent said stationary position, either visually or by a photomultiplier.

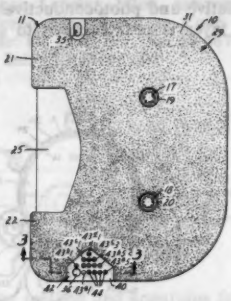
3,666,361

CODE STRUCTURE ON FILM CARTRIDGES

Paul A. H. Pankow, Burnsville, and Richard Alan Devries, New Brighton, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 2, 1970, Ser. No. 7,745
Int. Cl. G03b *23/02*
U.S. Cl. 352—78 C 13 Claims

Code structure is provided on the exterior of a film cartridge by assigning surface irregularities of different geometric shape to different values for a film variable, and forming that surface irregularity that corresponds with film stored in the cartridge on the exterior of the cartridge. In one method for forming the code structure, the cartridge is molded with a set of surface irregularities, at least one of which includes structure that makes that surface irregularity inactive in a code adapted to be sensed by a sensing member in a camera. To form a different code, a different one of the surface irregularities includes inactivating structure; the change may be made by moving a mold piece in the mold in which the cartridge is made or by removing the inactivating structure after the molding operation.

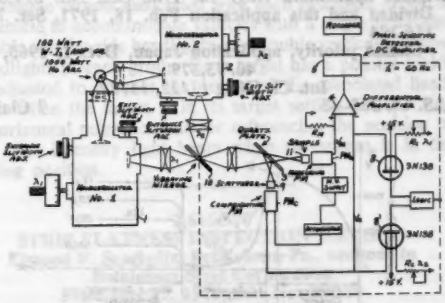


3,666,362

DUAL WAVELENGTH SPECTROPHOTOMETRY

Britton Chance, % Johnson Research Foundation Medical School, University of Pennsylvania, Philadelphia, Pa. 19104

Filed Dec. 22, 1970, Ser. No. 100,697
Int. Cl. G01j *3/42;* G01n *21/22*
U.S. Cl. 356—88 19 Claims



A dual wavelength spectrophotometer in which compensation is made for lamp noise by extracting a portion of the time-shared dual wavelength light beam before it enters the sample and generating a compensation signal therewith in an auxiliary photomultiplier. The compensation signal is normalized and subtracted from the measure signal in a differential amplifier over a band width including frequencies considerably above the light switch frequency.

3,666,363

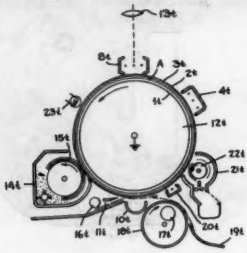
ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS

Hiroshi Tanaka, Katsumi Nagamatsu, Giichi Marushima, and Shinkichi Takahashi, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of appplication Ser. No. 571,538, Aug. 10, 1966. This application Feb. 18, 1971, Ser. No. 116,557
Claims priority, application Japan, Aug. 12, 1965, 40/49,134
Int. Cl. G03g *13/22, 15/10, 15/22*
U.S. Cl. 355—17 11 Claims

A process for forming an electrostatic image in a plate having a photoconductive layer with an insulative overlayer and being characterized in having carrier charge of a polarity corresponding to the conductivity type of the photoconductive layer injectable into the photoconductive layer and bound in the region of the interface between the insulative and photoconductive layer, wherein the insulative layer is initially charged with a polarity inducing

semiconduction in the photoconductive layer and causing charge migration therein and therethrough to the interface of the insulative and photoconductive layers. The photoconductive layer is next exposed to a pattern of image



light while the insulative overlayer is subjected to A.C. corona discharge whereby said interface charge is selectively attenuated to form said electrostatic image. The formed image is intensified in contrast by thereafter exposing the photoconductive layer to radiation.

3,666,364

ELECTROPHOTOGRAPHIC APPARATUS

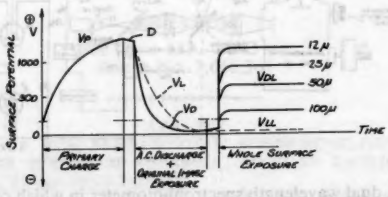
Giichi Marushima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Original application Aug. 10, 1966 Ser. No. 571,538. Divided and this application Feb. 18, 1971, Ser. No. 116,394

Claims priority, application Japan, Dec. 1, 1965, 40/73,379

Int. Cl. G03g *13/22, 15/22*

U.S. Cl. 355—3 **7 Claims**



An apparatus for forming an electrostatic image including a photosensitive plate having a base, a photoconductive layer overlying said base and an insulative layer overlying said photoconductive layer, said insulative layer having a thickness of from ten to fifty microns, including means for applying a charge of one polarity to said insulative layer, means for exposing said photoconductive layer to a pattern of image radiation while applying an alternating current discharge to said insulative layer to form an electrostatic image. The electrostatic image is intensified in contrast by thereafter exposing the photoconductive layer to radiation.

3,666,365

ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS INVOLVING PERSISTENT INTERNAL POLARIZATION

Hiroshi Tanaka, Shinkichi Takahashi, and Umi Tosaka, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

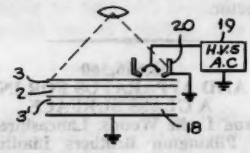
Original application Aug. 10, 1966, Ser. No. 571,538. Divided and this application Feb. 18, 1971, Ser. No. 116,393

Claims priority, application Japan, Sept. 1, 1965, 40/53,471

Int. Cl. G03g *13/22*

U.S. Cl. 355—17 **14 Claims**

A process and apparatus for forming an electrostatic image in a plate having an insulative layer, a photoconductive layer underlying said insulative layer and a base, wherein the insulative layer is initially charged in one polarity and is then subjected to A.C. corona discharge



while the photoconductive layer is exposed to an image pattern. The photoconductive layer is thereafter exposed to activating light whereby an intensified electrostatic image is formed.

3,666,366

REPRODUCTION CAMERA

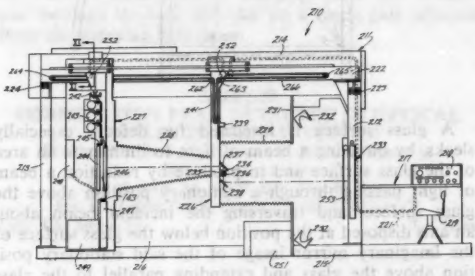
John Keeble, Ashlong Grove, and Edward Ieian Morgan, Ingrave, England, assignors to Sidney R. Littlejohn & Company Limited, London, England

Continuation-in-part of abandoned application Ser. No. 671,254, Sept. 28, 1967. This application Dec. 5, 1969, Ser. No. 882,611

Claims priority, application Great Britain, Nov. 19, 1969, 56,681/69

Int. Cl. G03b *27/76*

U.S. Cl. 355—56 **20 Claims**



A reproduction camera having a stationary copy-holder and independently movable lens and film carriages in which operation of the camera is controlled by an operator without moving from a control position and all the camera variables are selected and set under computer control and all the photographic operations are controlled by automatically operated sequence control means to achieve an end product having predetermined photographic characteristics.

3,666,367

DIGITAL RANGE MEASURING SYSTEM

Robert P. Farnsworth, Los Angeles, and Richard W. Wyeth, Agoura, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

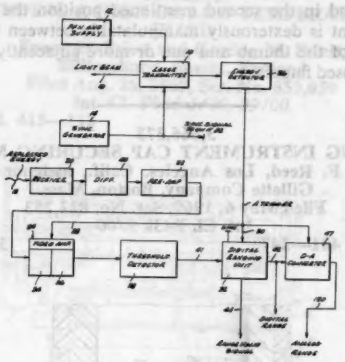
Filed June 1, 1970, Ser. No. 42,295

Int. Cl. G01c *3/08*

U.S. Cl. 356—5 **8 Claims**

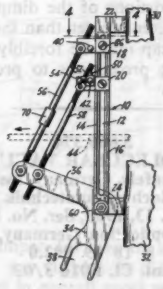
A digital system for measuring the range of a remote object in response to laser energy reflected from the object and for controlling the mode of operation. When logic circuits determine that a signal is a valid return signal (i.e. not noise energy) the system switches to a track mode of operation wherein it responds only to sig-

nals coincident with a relatively narrow tracking gate. If the return signal should fade (detectable signal not received) a counter, which stores the digital complement of the range information and which positions the tracking gate, is automatically recycled to the last stored range



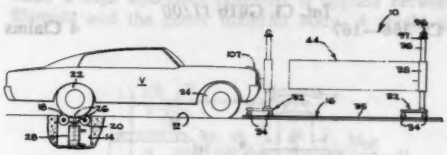
complement value. Another counter circuit counts unsuccessful transmission and reception (ranging) periods and after a predetermined number of consecutive such periods the system switches from the track to the acquisition mode.

3,666,368
ARCHERY SIGHT AND RANGE FINDER
Harold R. Sprandel, 19 Brookside Drive, Monroe, Conn. 06468
Filed Feb. 18, 1971, Ser. No. 116,307
Int. Cl. F41g 1/02
U.S. Cl. 356—21 **10 Claims**



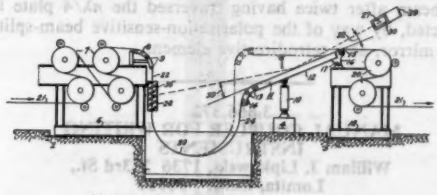
A sight and range finder for archers, consisting of an attachment having a vertical slide on which two sliders are vertically movable. The sliders have parallel, horizontal sight bars, and when moved in spaced relation, enable the archer to sight the game between them. One sight bar also has a bull's-eye sight, to zero-in on the body of the game. A pivoted finger piece on the slide can be manually adjusted, and is connected to the sliders in such a manner as to not only vertically adjust the latter but also to automatically vary the spacing between them, this being accomplished by links between the finger piece and sliders. Game which is far away and appears small, requires close spacing of the sight bars which results in their being automatically positioned vertically to a lower level, together with the bull's-eye sight, so as to provide for a higher trajectory of the arrow, and vice versa.

3,666,369
HEADLIGHT TESTER
Tracy Carrigan, Lansing, Mich., assignor to FMC Corporation, San Jose, Calif.
Filed Mar. 18, 1970, Ser. No. 20,687
Int. Cl. G01j 1/00
U.S. Cl. 356—121 **9 Claims**



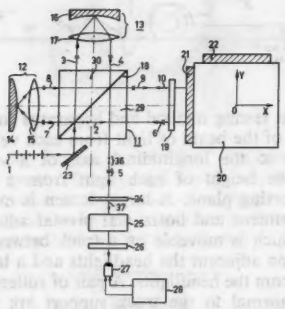
A headlight testing method and apparatus for detecting the direction of the beam of light from each vehicle headlight relative to the longitudinal axis of a vehicle and relative to the height of each light from a horizontal vehicle supporting plane. A target screen is mounted for vertical adjustment and horizontal pivotal adjustment on a carriage which is movable on a track between a target setting position adjacent the headlights and a testing position spaced from the headlights. A pair of rollers journaled about axes normal to the track support are rotated by the drive wheels of the vehicle for aligning the longitudinal axis of the vehicle into a position parallel with the track. The screen includes three vertically and horizontally adjustable targets associated with each headlight group of a vehicle to accommodate vehicles with a single headlight, double side-by-side headlights, and double vertically spaced headlights in each group. Each target has a pointer which is adjusted to contact the center of the associated headlight when the target is in its target setting position and a horizontal reference bar for referencing the position of the high intensity light beam when the screen is in the testing position.

3,666,370
STRIP FLATNESS INSPECTION METHOD
Elwood F. Seasholtz, Bethlehem, Pa., assignor to Bethlehem Steel Corporation
Filed July 15, 1970, Ser. No. 55,129
Int. Cl. G01n 21/16
U.S. Cl. 356—200 **3 Claims**



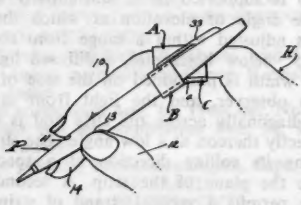
A method of visually inspecting portions of moving steel sheet or strip in a continuous processing line, wherein the strip is supported in a substantially horizontal position, the angle of elevation at which the strip is supported is adjusted within a range from about horizontal to 25° below horizontal, a diffused light source of specified width is positioned on the side of the strip opposite an observer, and the light from said source is directed diagonally across the strip and is caused to impinge directly thereon at a low angle. The strip is then viewed along its rolling direction at a specified low angle above the plane of the strip. A second diffused light source permits a vertical strand of strip adjacent a free loop of the strip to be viewed across the strip at right angles to the rolling direction for a further inspection of the strip.

3,666,371
APPARATUS FOR MEASURING THE RELATIVE DISPLACEMENT OF AN OBJECT
Hendrik de Lang, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 4, 1971, Ser. No. 112,722
Claims priority, application Netherlands, Feb. 7, 1970, 7001770
Int. Cl. G01b *11/00*
U.S. Cl. 356—167 **4 Claims**



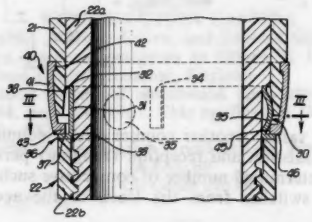
An apparatus is discussed for measuring the relative displacement of an object, in particular a measuring slide, with respect to a fixed reference point by means of at least one optical element which is rigidly secured mechanically to the object and reflects radiation from a source of radiation which emits two beams of radiation polarized at right angles to one another which beams are divided in two spatially separated sub-beams by a polarisation-sensitive beam splitting mirror the optical element having been inserted in the path of one sub-beam so as to extend at right angles to the direction of this sub-beam, a reflector having been inserted on the path of the other sub-beam, which sub-beams are combined and then are applied to a radiation detector from which an electrical signal is derived which is a measure of the displacement. It is set forth that for this purpose there is inserted in the path of the sub-beam which is reflected at the optical element, which element is a high-precision plane mirror, an $n\lambda/4$ plate (where n is an odd integer) which is arranged in diagonal orientation and is traversed four times by the respective sub-beam, for which purpose this sub-beam after twice having traversed the $n\lambda/4$ plate is reflected, by way of the polarisation-sensitive beam-splitting mirror, at a retrodirective element.

3,666,372
MANUAL COUPLER FOR WRITING INSTRUMENTS
William J. Lipkowski, 1736 253rd St., Lomita, Calif. 90717
Filed Jan. 14, 1970, Ser. No. 2,740
Int. Cl. B43k *23/00*
U.S. Cl. 401—8 **4 Claims**



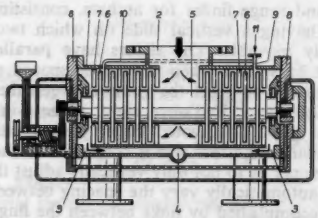
A coupling adapted to flexibly connect a writing instrument to a person's hand, thereby to have a remote position where it is immediately accessible and in a tactile position where it is manipulatable. The coupling is preferably a one piece device having hinged and thereby relatively movable bodies, one body releasably engageable with a finger of the hand and the other releasably engageable with the writing instrument. In the first mentioned position the writing instrument is held clear of and parallel to the finger to which it is connected, the index finger; and in the second mentioned position the writing instrument is dexterously manipulatable between the tactile tips of the thumb and one or more adjacently placed and opposed fingers.

3,666,373
WRITING INSTRUMENT CAP SECURING MEANS
Meuriel F. Reed, Los Angeles, Calif., assignor to The Gillette Company, Boston, Mass.
Filed May 6, 1969, Ser. No. 822,253
Int. Cl. B43k *9/00*
U.S. Cl. 401—247 **3 Claims**



In a writing instrument including a barrel or body and a cap, an improvement in means for releasably securing the cap to the barrel or body when the instrument is not in use including the provision of a radially inwardly directed lip fixedly carried by the open end of the cap which receives the forward end of the barrel, a cylindrical ring fixedly secured on the barrel and including at least three projections or dimples generally equally spaced about the circumference of the ring, the ring being smaller in diameter than the diameter of the cap lip and the radially outermost portions of the dimples on the barrel ring defining a diameter greater than the diameter of the cap lip so that the cap may be forcibly axially mounted over the barrel ring projections to provide an audible, positive, snap fit.

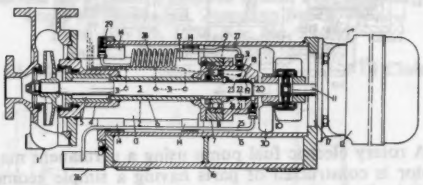
3,666,374
ROTARY MOLECULAR VACUUM PUMP
Willi Becker, Braunfels, Germany, assignor to Arthur Pfeiffer Hochvakuumtechnik GmbH
Filed Nov. 13, 1969, Ser. No. 876,250
Claims priority, application Germany, Nov. 20, 1968, P 18 09 902.0
Int. Cl. F01d *3/02*
U.S. Cl. 415—100 **7 Claims**



A rotary molecular vacuum pump having either one multistage compression set, or a plurality of multi-stage compression sets connected in parallel, between the prevacuum side and the high vacuum side of the pump has

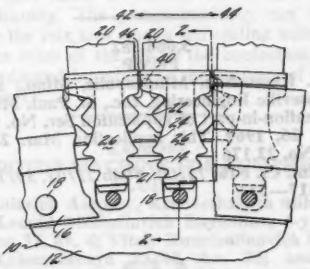
at least one gas inlet which communicates with the multistage compression set, or with each such set, at an intermediate position between the pre-vacuum and high vacuum sides of the pump.

3,666,375
PUMPING A HIGH OR LOW TEMPERATURE FLUID
Ernest H. Priest and Gordon M. Priest, Billingshurst, Sussex, England
Filed Aug. 26, 1969, Ser. No. 853,059
Int. Cl. F04d *1/00, 29/00*
U.S. Cl. 415—112 **3 Claims**



Heat-transfer systems using oxidizable heat-transfer fluids have oxidation problems around the pump shaft seal. According to this invention, the problem is solved by having the seal at the remote end of a barrier section connected to the casing of the pump so that the barrier section can be cooled to keep the seal cool enough.

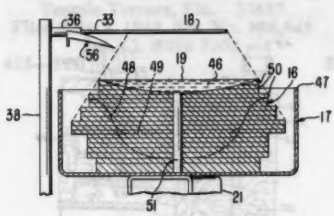
3,666,376
TURBINE BLADE DAMPER
Nicholas Damlis, Tolland, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Jan. 5, 1971, Ser. No. 104,057
Int. Cl. F01d *5/16*
U.S. Cl. 416—219 **5 Claims**



A vibration damper for use in a turbine rotor of a high temperature gas turbine is disclosed. The damper which is X shaped in overall cross section with a pair of damping legs, a protruding assembly lug, and a pair of positioning legs is located in the turbine rotor in a cavity formed between the extended necks of a pair of adjacent turbine blades in one direction and end cover plates in the other direction.

3,666,377
HIGH VACUUM GETTERING PUMP
David D. Robertson, Palo Alto, and William R. Wheeler, Saratoga, Calif., assignors to Varian Associates, Palo Alto, Calif.
Filed June 2, 1969, Ser. No. 829,386
Int. Cl. F04b *37/02*
U.S. Cl. 417—49 **15 Claims**

A high vacuum gettering pump is described which is capable of providing a high vaporization rate of a getter material. The pump includes a high thermionic emission cathode filament disposed over a surface of a bulk supply of a getter material such as titanium. The getter material is contained within a cup-shaped heat shield and has a peripheral configuration minimizing the amount of material at the sides of the body of getter material which will not be melted by thermionic emission from the filament when a high operating potential is applied between the filament and the getter material body. A shield is also



provided blocking line-of-sight travel of vaporized getter material to a portion of the filament which does not reach a high enough temperature to prevent condensation of the getter material. The shield is tapered inwardly and curved away from the filament adjacent an unshielded portion thereof to minimize the effect caused on the operation of the filament by the build-up of getter material on the shield.

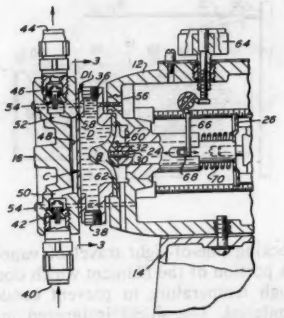
3,666,378
FRICTION ANCHOR FOR FLUID OPERATED DOWNWELL PUMPS
Peter S. Bloudoff, Whittier, Calif., assignor to Armco Steel Corporation, Middletown, Ohio
Filed Oct. 16, 1970, Ser. No. 81,468
Int. Cl. F04b *47/10*
U.S. Cl. 417—358 **15 Claims**

A friction anchor for fluid operated downwell pumps which precludes gross movement of the pump in operation so as to prevent chafing of the seals on the outside diameter of the pump which establish and maintain the hydraulic circuitry. The friction anchor includes a long, thin-walled, expandable sleeve on the pump which fits closely with the mating gripping surface of a seal on the well casing or housing sleeve. When the pump becomes operational, high pressure from the operating fluid is applied on the inside of the expandable sleeve and an actual interface fit between the expandable sleeve and the casing or housing sleeve seal is simulated.

3,666,379
TANDEM DIAPHRAGM METERING PUMP FOR CORROSIVE FLUIDS

Lawrence R. Mitchell, Fort Lee, and William C. Conkling, Essex Fells, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed July 17, 1970, Ser. No. 55,640
Int. Cl. F04b 43/06, 45/00
U.S. Cl. 417—395 6 Claims

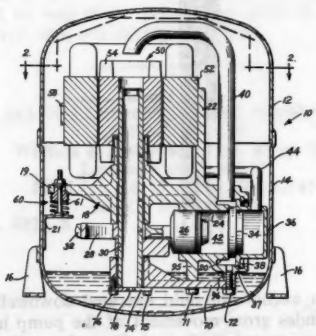


A diaphragm type metering pump, especially adapted for handling corrosive fluids, incorporates a slack resilient diaphragm disk made of a chemically inert polymer, such as polytetrafluorethylene, which is spaced from the primary positive displacement diaphragm. A liquid medium fills the space between the two diaphragms and transmits reciprocable motion of the primary diaphragm to the slack secondary diaphragm which is in operative contact with the fluid being pumped.

3,666,380
COMPRESSOR BLOCK WITH BANDED MOTOR

Charles B. Ellis, Fort Worth, Tex., assignor to Lennox Industries, Inc.

Filed Sept. 1, 1970, Ser. No. 68,622
Int. Cl. F04b 17/00, 35/04
U.S. Cl. 417—415 8 Claims

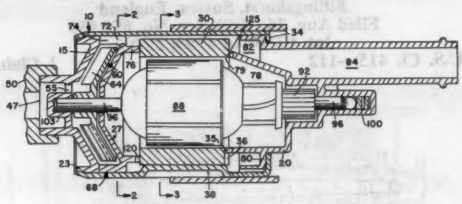


A refrigerant compressor having a compressor block with a lower portion defining a crankcase and an upper fragmentary annular portion defining a mounting for the electric drive motor. The electric drive motor is banded to the upper fragmentary annular portion in such manner that it can be readily removed to permit repair or maintenance of the electric drive motor.

3,666,381
SUBMERSIBLE FUEL PUMP

Ralph E. Ulm, Claude F. Phillips, Michael J. Sullivan, Larry C. Collins, and William Russell Parrent, Fairfield, Ill., assignors to Airtex Products, Division of United Industrial Syndicate, New York, N.Y.

Filed May 20, 1970, Ser. No. 37,951
Int. Cl. F04b 17/00, 35/04
U.S. Cl. 417—423 16 Claims

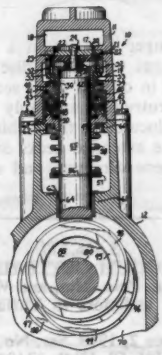


A rotary electric fuel pump using a permanent magnet motor is constructed of parts having a simple geometric pattern for mass production by sheet metal stamping and plastic molding. The construction provides for housing a cylindrical magnet stator for a motor field and a high-speed armature. The fuel medium being pumped flows over the magnet effecting cooling, with some diverting of flow through the armature for cooling. A further feature resides in the construction of an impeller having flow passage to the stator slots phased in such a manner that peak flow pressure at the slots is evened out around the impeller. Thus, the impeller vane spacing is related to that of the stator slots other only one flow pressure peak occurs at a time, and such peaks occur sequentially at wide spaced points around the rotary axis. This minimizes electric current peaks and brush sparking as well as bearing wear. The construction is fully sealed for submerged use in fuel tanks.

3,666,382
PUMP

Robert F. Rasmussen, Minneapolis, Minn., assignor to Roseville Engineering, Inc., St. Paul, Minn.

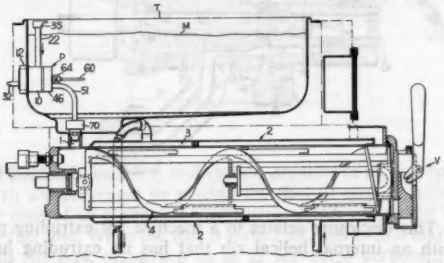
Continuation-in-part of application Ser. No. 810,681, Mar. 26, 1969. This application Mar. 24, 1970, Ser. No. 22,176
Int. Cl. F16j 15/00; F04b 21/02, 39/10
U.S. Cl. 417—533 12 Claims



A housing having three in-line cylindrical openings formed therein with an outlet and inlet in communication with each of said openings, an insert positioned in each

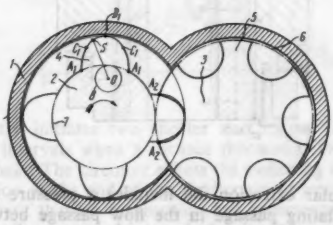
of said openings for forming outlet valve means, a second insert positioned in each of said openings for forming inlet valve means, packing positioned in each of said openings and cooperating with the inserts to define a cylinder, and a plunger mounted in each of said cylinders for reciprocating movements. The further improvement including means subject to fluid outlet pressure operating on the packing to maintain a compression force on said packing. Said three plungers being reciprocated sinusoidally by means of eccentric members attached to a drive shaft.

3,666,383
POSITIVE DISPLACEMENT, GEAR TYPE PUMP
Bernfried M. Werner, Pompano Beach, Fla., assignor to Louis A. M. Phelan, Pompano Beach, Fla.
Filed July 29, 1970, Ser. No. 59,191
Int. Cl. F01c *1/08, 1/18, 21/00*
U.S. Cl. 418—15 **14 Claims**



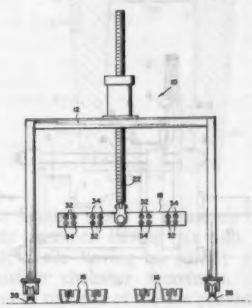
A positive displacement, gear type pump having a pair of gears in constant mesh for mixing and feeding air and a confection mix prior to delivery into a freezing cylinder. The pump operates at a relatively high speed so as to thoroughly mix the air and confection mix and provide a highly aerated mix to be frozen. The entire pump can be quickly and easily assembled and disassembled for frequent cleaning. The pump assembly can be easily mounted in the mix tank and is self-sealing with the wall thereof. The ratio of the air to the confection mix can be readily adjusted by adjusting the amount of air taken into the pump.

3,666,384
SCREW-ROTOR MACHINE FOR COMPRESSIBLE FLUIDS
Pavel Evgenievich Amosov, Kronverkskaya ulitsa 29/37, kv. 87; Leonid Mikhailovich Imyanitov, 6-ya Sovetskaya ulitsa 33, kv. 4; Vitaly Konstantinovich Smekhov, Ulitsa Kolomenskaya 33/40, kv. 25; and Valery Leonidovich Trofimov, Ulitsa Matrosova 12, kv. 8, all of Leningrad, U.S.S.R.
Filed Oct. 20, 1970, Ser. No. 82,297
Int. Cl. F01c *1/16, 1/24;* F04c *1/10*
U.S. Cl. 418—201 **1 Claim**



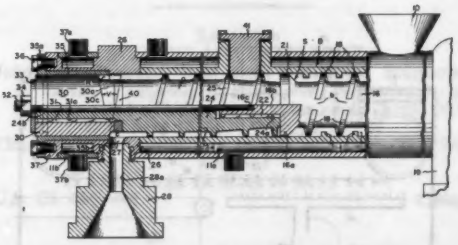
A screw-rotor machine for compressible fluids, wherein the profile of the head of each of the driving rotor lobes is defined by two lengths of epicycloids interconnected by a conjugate curve. The conjugate curve is a length of the elongated hypocycloid formed during rolling of a base circle along the inner side of a driving rotor rolling circle by a point located outside the base circle whose radius is larger than zero but smaller than the radius of the rolling circle.

3,666,385
APPARATUS FOR MAKING PRESTRESSED CONCRETE MEMBERS
Robert S. Baker, 511 Hibiscus Drive, Temple Terrace, Fla. 33617
Filed July 3, 1969, Ser. No. 838,945
Int. Cl. B28b *7/08*
U.S. Cl. 425—111 **2 Claims**



An apparatus for forming prestressed concrete products. A stress frame including properly tensioned tendons is lowered over a casting form which does not feel the tension. The concrete is poured, compacted, and allowed to reach a pre-set condition in which it is self-supporting yet plastic. The stress frame, with the product attached thereto, is then separated from the casting form, and the product undergoes final curing with all its exterior surfaces exposed. The tendons are then released, transferring tension to the concrete product.

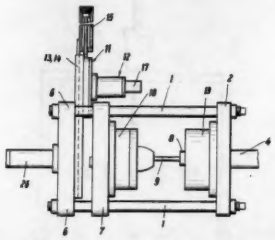
3,666,386
DIRECT RADIALLY EXTRUDING MIXER
Larry N. McElroy and Varo A. Shores, Saginaw, Mich., assignors to Baker Perkins Inc., Saginaw, Mich.
Filed Feb. 11, 1970, Ser. No. 10,387
Int. Cl. B29f *3/02*
U.S. Cl. 18—12 SA **8 Claims**



A direct extrusion mixer including a barrel forming a mixing passage or chamber having a material receiving inlet and a radially disposed extrusion outlet. A reciprocating and rotating mixer shaft is accommodated in the passage and includes gapped flights rearwardly of the extrusion outlet cooperating with kneading teeth on the barrell wall for mixing the material and forwarding the material toward the extrusion outlet. To eliminate output surges

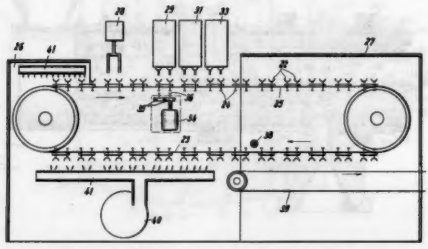
in the extrudate caused by the oscillating motion of the mixer shaft, the shaft has a plug with a symmetrical axially inclined rear face, the portion of the face immediately adjacent the outlet being substantially in radial alignment with the forward edge of the outlet at all times.

3,666,387
MOLD CLOSURE MEANS
Wilhelm Cyriax, W. R. Neustadter Str. 81, Kottingbrunn, Austria
Filed Nov. 26, 1969, Ser. No. 880,115
Claims priority, application Germany, Dec. 13, 1968, P 18 15 712.5-24
Int. Cl. B29f *1/06*
U.S. Cl. 425—242 **2 Claims**



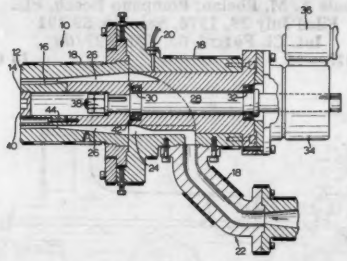
An expandable unit, carried on a fixed end plate of an injection-molding machine to exert mold-closing pressure upon a movable platen, comprises a pressure box on the end plate whose piston supports an elongate thrust member composed of threadedly interconnected portions to enable adjustment of its effective length. The entire unit is transversely slidable along a track on the end plate into a retracted position beyond the outline of the movable platen whereby the latter more closely approaches the end plate upon the opening of the mold.

3,666,388
APPARATUS FOR PRODUCING HOLLOW SWEET MEATS
Hugo Oberwelland and Uwe Klahn, Halle, Germany, assignors to August Storck G.m.b.H., Halle, Germany
Filed Jan. 28, 1970, Ser. No. 6,449
Int. Cl. A23g *3/12, 1/20*
U.S. Cl. 425—261 **4 Claims**



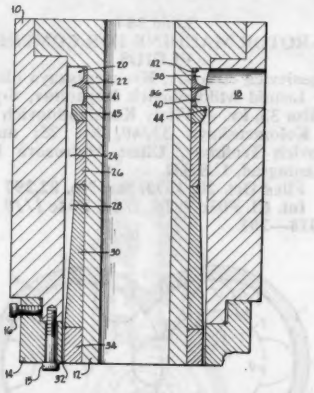
A method of and apparatus for producing hollow sweetmeats by spinning an open top mould containing a measured quantity of castable confectionary material or dispensing such a quantity of material into an open top mould from a rotating dispenser so that a hollow body corresponding to the internal shape of the mould is formed by centrifugal force acting on the castable material, cooling the body until it is set, and ejecting the body from the mould.

3,666,389
EXTRUSION APPARATUS FOR MAKING CONDUIT PIPE
Robert S. Nelson, Islington, Ontario, Canada, assignor to Dominion Gasket & Manufacturing Co. Limited, Toronto, Ontario, Canada
Filed Nov. 24, 1969, Ser. No. 879,387
Int. Cl. B29d *23/04*
U.S. Cl. 425—324 **2 Claims**



This disclosure relates to a machine for extruding pipe with an internal helical rib that has an extruding head with an annular extruding opening defined in part by a rotating core. The core is formed with a groove so that as plastic is forced through the head, the internal surface is formed with a helical rib due to the action of the rotating groove.

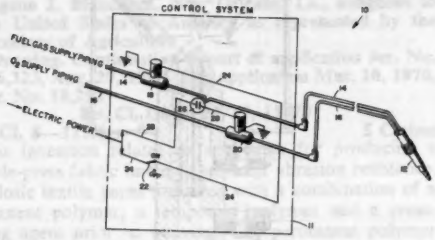
3,666,390
EXTRUSION DIE
Milo Gerow, 108 Ohio Ave., Beach Haven, N.J. 08008
Filed Sept. 2, 1969, Ser. No. 854,646
Int. Cl. B29d *23/04*
U.S. Cl. 425—380 **10 Claims**



A tubular extrusion die includes a pressure chamber and regulating passage in the flow passage between the entrance port of the die and the annular die lips where the extrusion material is shaped as it leaves the die. The pressure chamber includes a plurality of annular pressure channels in which the upper communicates with the lower, and which is arranged to control the annular distribution

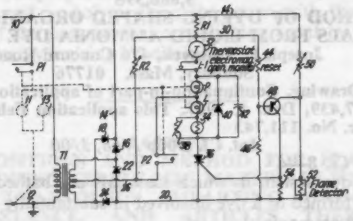
of flow (pressure, velocity and volume) of extrusion material to the die lips. The cross-sectional area of the regulating passage of the pressure chamber is less than or equal to that of the entrance port.

3,666,391
ANTI-FLASHBACK DEVICE
Charles A. Van Horn, Country Club Hills, Ill., assignor to Chemetron Corporation, Chicago, Ill.
Filed Apr. 27, 1970, Ser. No. 32,296
Int. Cl. F23n *1/02*
U.S. Cl. 431—12 **16 Claims**



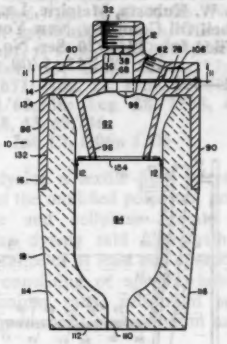
Flashback, backfire, and carbon deposits in an oxy-fuel torch are prevented by placing the flow of oxygen under the control of a pressure responsive switch connected to the fuel line. When the fuel is turned off, this switch maintains the flow of oxygen so as to prevent a carbonizing flame from developing before the residual fuel is consumed, but cuts off the flow of oxygen before dangerous concentrations of oxygen can develop in the fuel line. At the time of ignition, this same pressure switch prevents oxygen from entering the fuel line before the flow of fuel is established and thereby prevents flashback and backfire.

3,666,392
SAFETY SHUTOFF
Helmut D. Julinot, Toronto, Ontario, Canada, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed July 16, 1970, Ser. No. 55,393
Claims priority, application Canada, Mar. 2, 1970, 076,241
Int. Cl. F23n *5/14*
U.S. Cl. 431—78 **4 Claims**



Circuitry initiates two shorter and longer timed but variable intervals when a furnace thermostat switches to call for heat. The circuitry effects the switching to initiate combustion at the end of the shorter timed interval; but, in the event that no combustion has commenced by the end of the longer timed interval, the circuitry prevents the combustion thereafter until a reset operation has been performed. Preferably the reset is mechanical. If combustion starts before the end of the longer timed interval, the timing of the longer timed interval ceases.

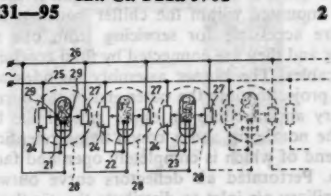
3,666,393
BURNER STRUCTURE AND METHOD
Theodore E. Davies, Hudson, Ohio, assignor to The North American Manufacturing Company, Cleveland, Ohio
Filed Feb. 2, 1970, Ser. No. 7,451
Int. Cl. F23n *3/00*; F23r *1/02*
U.S. Cl. 431—90 **14 Claims**



A burner for heating metal in a furnace or the like including a body member having air and gas metering orifices therein, a tile having an axially extending secondary combustion chamber therein, a tile mounting member secured to one end of the tile providing a primary combustion chamber for the burner and having axially extending openings with slanted sides therethrough extending into the primary combustion chamber and the secondary combustion chamber in the tile, and a gasket positioned between the body member and tile mounting member for directing primary and secondary air through the tile mounting member openings into the combustion chambers in a ratio depending on the area of the openings and imparting a swirl to the air in accordance with the alignment of the openings through the gasket and the openings through the tile mounting member.

Upstream and downstream pressure taps are provided in the body member for ascertaining air and gas flows. A flat annular member having openings therethrough is positioned between the secondary air and the secondary combustion chamber in one modification of the burner disclosed to stabilize the burner flame. The burner may be mounted in the roof, hearth or the wall of a furnace and when mounted in the wall of a furnace, a venturi tile may be positioned axially of the burner to insure high entrainment and recirculation of furnace gases.

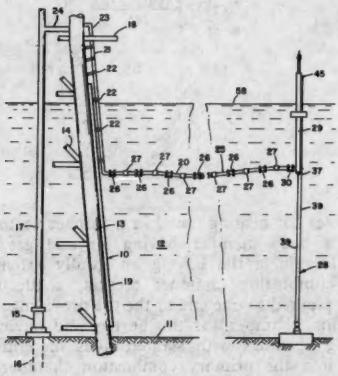
3,666,394
MULTIFLASH LAMP UNIT
Johannes Gerardus Bok and Wilhelmus Polycarpus de Graaf, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed May 18, 1970, Ser. No. 37,976
Claims priority, application Netherlands, May 30, 1969, 6908333
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 **2 Claims**



A device for the series ignition of combustible flashbulbs which are essentially connected in parallel with one

another. Each flashbulb is in series with a switching element which responds to the energy emitted during flashing of said flashbulb, and permanently interrupts the electric connection between the bulb and the circuit.

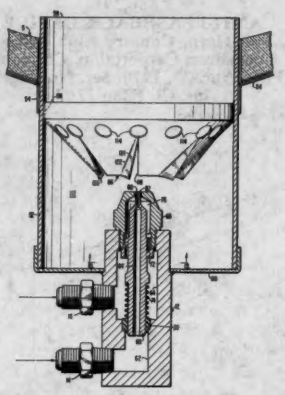
3,666,395
OFFSHORE GAS FLARE APPARATUS
James W. Kubasta, Metairie, La., assignor to Shell Oil Company, New York, N.Y.
Filed July 29, 1970, Ser. No. 59,247
Int. Cl. F23c *9/00*
U.S. Cl. 431—202 **5 Claims**



Apparatus for conducting waste gas produced from an offshore well extending into the floor of a body of water to a remote location. A platform structure rests on the water floor and includes a gas line in selective fluid communication with the well, the gas line leading to the remote location. A gas flare pipe is buoyantly supported in a vertical position at the remote location and is in fluid communication with the gas line. The support for the pipe includes a relatively short spar buoy anchored to the floor of the body of water through an elongated flexible cable pivotally attached thereto. In this manner, waste gas from the well may be burned off (or vented to the atmosphere) while the support allows for movement of the gas flare pipe with water motion.

3,666,396
COMBUSTION APPARATUS
Eugene C. Briggs and William C. Wellbaum, Dayton, Ohio, assignors to Koehring Company, Milwaukee, Wis.
Filed Mar. 29, 1971, Ser. No. 128,726
Int. Cl. F23q *3/00*
U.S. Cl. 431—264 **10 Claims**

The generator of a compact absorption cycle chiller is heated by oil fired combustion apparatus made up of a burner assembly mounted on the heat receiver for the generator and a fluid supply and control assembly separately mounted within the chiller housing. Both assemblies are accessible for servicing from one side of the housing and they are connected by fluid conduits and electrical cables. The burner assembly includes an aspirator nozzle projecting into the outer end of the burner tube, an auxiliary air inlet into an upper side of the burner tube near the nozzle tip and a coned flame retention head the small end of which is completely open and faces the nozzle tip. Perforated air deflectors curve outwardly from the auxiliary air inlet to distribute the air throughout the zone behind and around the coned flame retention head. Slots each having an outwardly inclined vane adjacent one of its margins extend longitudinally of the head and open at both the periphery and the small end of the head to direct auxiliary air from this zone into an axially swirling pattern of motion within the head, and additional



openings of circular configuration are disposed in a ring about the conical head in the vicinity of but spaced from its large end to direct auxiliary air toward the axis of the head.

3,666,397
TRANSFER PRINTING WITH FIBRE-REACTIVE DYES
Keshav V. Datye, Goregaon-Bombay, India, and Branimir Milicevic, Riehen, and Hermann Werdenberg, Basel, Switzerland, assignors to Ciba-Geigy AG
No Drawing. Filed Mar. 13, 1969, Ser. No. 807,104
Claims priority, application Switzerland, Mar. 22, 1968, 4,278/68; Jan. 21, 1969, 840/69
Int. Cl. D06p *1/38*
U.S. Cl. 8—2.5 **13 Claims**

A dyeing or printing process wherein a natural or synthetic or semi-synthetic material, is kept in contact in the wet state, for 20 to 220 seconds, on one side with a support having a colour print produced with at least one fibre-reactive dyestuff with or without a disperse dyestuff and, on the other side, with a support heated to at least 100° C.

3,666,398
METHOD OF DYEING SHAPED ORGANIC MATERIALS FROM LIQUID AMMONIA DYE BATHS
Joseph P. Tratnyek, 476 Concord Road, Sudbury, Mass. 01776
No Drawing. Continuation-in-part of application Ser. No. 687,439, Dec. 4, 1967. This application Feb. 1, 1971, Ser. No. 111,743
Int. Cl. D06p *1/68, 3/00*
U.S. Cl. 8—4 **10 Claims**

A dye system in which materials are bathed in a dye-bath formed of a dye dissolved in substantially anhydrous liquid ammonia.

3,666,399
ENZYMATIC PEROXYDIPHOSPHATE HYDROLYSIS
Harry Marcus Castrantas, Trenton, N.J., assignor to FMC Corporation, New York, N.Y.
Filed July 31, 1970, Ser. No. 60,003
Int. Cl. D06l *3/02*
U.S. Cl. 8—111 **7 Claims**

This invention provides a safe, controlled peroxymonophosphate-generating composition comprising peroxydi-

phosphate and a phosphatase enzyme-containing substance. The composition is used by addition of water, which causes peroxymonophosphate to be generated at a safe, controlled rate by the enzyme-induced hydrolysis of the peroxydiphosphate.

3,666,400

SIZING OF YARNS AND FIBERS WITH COMBINATIONS OF POLYMERS AND CROSSLINKING AGENTS

John T. Lofton and Robert J. Harper, Jr., Metairie, and Eugene J. Blanchard, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Continuation-in-part of application Ser. No. 756,323, Aug. 29, 1968. This application Mar. 10, 1970, Ser. No. 18,292

Int. Cl. D06m *13/52, 15/70*

U.S. Cl. 8—115.6 5 Claims

This invention relates to a process for producing a durable-press fabric having a superior abrasion resistance. Cellulosic textile yarns are sized with a combination of a permanent polymer, a temporary polymer and a crosslinking agent prior to weaving. The permanent polymer includes polyurethanes, polyacrylates, butadiene-styrene copolymers, butadiene-acrylonitrile copolymers, and ethylene-vinylacetate copolymers. A temporary polymer is polyvinyl alcohol. Crosslinking agents include dimethylol dihydroxy-ethylenurea (DMDHEU), dimethylol methoxyethylcarbamate, methylol melamine, and dimethylol propyleneurea.

3,666,401

TREATMENT OF TEXTILES TO IMPART WRINKLE-RESISTANT AND FIRE-RESISTANT PROPERTIES

Joseph A. Cahill, Philadelphia, and Joseph A. Meyers III, Springfield, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed Dec. 11, 1970, Ser. No. 97,313

Int. Cl. D06m *13/28, 13/54*

U.S. Cl. 8—116.2 8 Claims

Fire resistance and wrinkle resistance are imparted to cellulosic textile materials without adversely affecting other properties by impregnating the material with an unsymetrical cross-linking agent that contains a vinyl group and a group that is chemically reactive toward cellulosic hydroxy groups, reacting the aforesaid reactive group with the cellulose in the presence of a chemical catalyst without reacting the vinyl groups, washing to remove unreacted chemicals, impregnating with N,N',N''-triallyl phosphoric triamide and co-polymerizing the latter with the vinyl groups of the unsymetrical cross-linking agent by means of high energy ionizing irradiation.

3,666,402

COMPOSITIONS AND METHOD FOR FLAME-PROOFING CELLULOSIC MATERIALS WHILE SIMULTANEOUSLY IMPARTING WRINKLE RESISTANCE, AND ARTICLES THEREBY PRODUCED

Joseph A. Meyers III, Springfield, and Joseph A. Cahill, Philadelphia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,815

Int. Cl. D06m *13/44*

U.S. Cl. 8—116.2 8 Claims

Fire resistance and wrinkle resistance are imparted to cellulosic materials by treatment with N,N',N''-triallyl phosphoric triamide without adversely affecting other properties of the cellulosic materials. The treating compositions and the treated article are also disclosed.

3,666,403

PROCESS FOR DYEING MODIFIED POLYESTER FIBERS IN THE PRESENCE OF QUATERNARY AMMONIUM SALTS

Shiro Shimauchi, Takatsuki-shi, Osaka-fu, Norihiro Minemura, Takeshi Matsui, and Kenji Ito, Ibaraki-shi, Osaka-fu, and Takue Shima, Shoji Kawase, and Masataka Oshima, Yamaguchi-ken, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Mar. 4, 1969, Ser. No. 804,294

Claims priority, application Japan, Mar. 14, 1968, 43/16,906; Apr. 5, 1968, 43/22,510; June 3, 1968, 43/56,828; July 19, 1968, 43/51,277; July 30, 1968, 43/54,071; Aug. 22, 1968, 43/60,034; Aug. 23, 1968, 43/60,356; Aug. 28, 1968, 43/61,638; Sept. 26, 1968, 43/69,736

Int. Cl. D06p *5/06*

U.S. Cl. 8—172 3 Claims

A method of dyeing a textile fiber selected from the group consisting of the modified polyester, polyvinyl chloride, acrylonitrile and cellulose acetate fibers, said method comprising dyeing said fiber with an anionic dyestuff in the presence of at least one compound selected from the group consisting of specific tertiary amines, quaternary ammonium salts, sulfonium salts, tertiary phosphines, and quaternary phosphonium salts.

3,666,404

METHOD OF INHIBITING CORROSION IN AQUEOUS SYSTEMS WITH HIGH MOLECULAR WEIGHT ALKYLENE OXIDE POLYMERS

Chin M. Hwa, Arlington Heights, Charles M. Bodach, Morton Grove, and C. D. Schroeder, Arlington Heights, Ill., assignors to Chemed Corporation, Cincinnati, Ohio

No Drawing. Filed Nov. 5, 1969, Ser. No. 874,397

Int. Cl. C23f *11/10, 11/18*

U.S. Cl. 21—2.7 8 Claims

High molecular weight polymers of ethylene oxide or copolymers of ethylene oxide with minor amounts of propylene oxide having a weight average molecular weight of at least about 100,000 but nevertheless water soluble at the concentrations and under the conditions of use, inhibit corrosion of metal surfaces in aqueous systems. Combination of such polymers with known corrosion inhibiting materials and compositions synergistically improves the effectiveness of the latter.

3,666,405

METHOD OF REMOVING CARBON DIOXIDE FROM GASEOUS MIXTURES

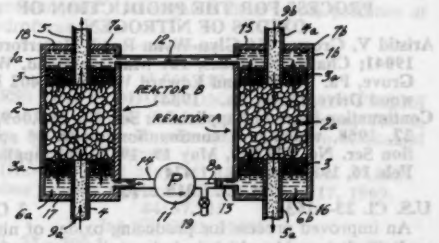
August Winsel, Kelkheim, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, and Varta Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 11, 1967, Ser. No. 630,128

Claims priority, application Germany, Apr. 16, 1966, S 103,215

Int. Cl. B01d *53/34;* H01d *27/00*

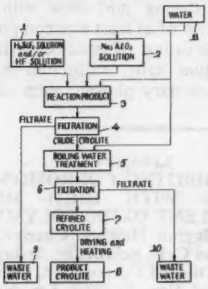
U.S. Cl. 23—2 R 9 Claims



Heterogeneous chemical or electrochemical reaction between substances contained in or forming at least two

separate fluid phases, or the transfer of one or more substances from one fluid phase to another fluid phase, is effected by contacting the fluid phases with each other while they are contained as separate phases and under different hydrostatic pressures, in the pores of porous structure in a novel apparatus.

3,666,406
METHOD FOR MANUFACTURING CRYOLITE WITH HIGH PURITY
Yukio Kitano, Yokohama, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 1970, Ser. No. 67,681
Claims priority, application Japan, Sept. 1, 1969, 44/68,677; July 21, 1970, 45/63,220
Int. Cl. C01f *7/54*
U.S. Cl. 23—88 **2 Claims**



Impure hydrofluoric acid or hydrosilicofluoric acid containing phosphoric acid, silicic acid, sulfuric acid, iron and so forth or a mixture of such acids is reacted with the aqueous solution of sodium aluminate at a temperature at or below 55° C. The resulting crude cryolite is subjected to refining with boiling water to remove impurities. Thus, a highly pure cryolite is manufactured.

3,666,407
PROCESS FOR PRODUCING SYNTHETIC HECTORITE-TYPE CLAYS
Justus K. Orlemann, Easton, Pa., assignor to Pfizer Inc., New York, N.Y.
No Drawing. Filed Jan. 28, 1971, Ser. No. 110,751
Int. Cl. C01b *33/28*
U.S. Cl. 23—111 **4 Claims**

Synthetic hectorite-type clay materials are prepared by calcining a mixture of Li_2CO_3 and talc, mixing with an aqueous solution of a sodium silicate and Na_2CO_3, and hydrothermally treating the resulting mixture. Subsequent drying is optionally provided.

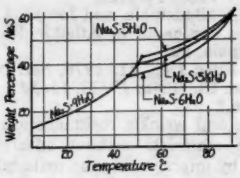
3,666,408
PROCESS FOR THE PRODUCTION OF OXIDES OF NITROGEN
Aristid V. Grosse, 456 Glyn Wynn Road, Haverford, Pa. 19041; Charles S. Stokes, 127 Madison Road, Willow Grove, Pa. 19090; and Edward W. Smith, 402 Longwood Drive, Exton, Pa. 19341
Continuation-in-part of application Ser. No. 805,069, Dec. 27, 1968, which is a continuation-in-part of application Ser. No. 639,880, May 19, 1967. This application Feb. 16, 1970, Ser. No. 11,474
Int. Cl. C01b *21/30*
U.S. Cl. 23—163 **2 Claims**

An improved process for producing oxides of nitrogen such as nitric oxide which includes (a) reacting nitrogen plasma with oxygen plasma, the plasma having been formed by an electric arc discharge, and (b) cooling the resulting gaseous reaction mixture from the plasma state to a temperature below the dissociation temperature of nitric oxide by (1) expanding the gaseous mixture at an expansion ratio in the range of from 30:1 to 200:1, the expansion beginning prior to the loss of the plasma state, and (2) contacting the expanded reaction mixture with cooler recycle gas.

3,666,409
METHOD OF STABILIZING SODIUM HYDROSULFITE
Yoshio Yoshikawa and Yasuhiro Sakai, Tokyo, Japan, assignors to Mitsubishi Edogawa Kagaku Kabushiki Kaisha, Tokyo, Japan
No Drawing. Filed Aug. 25, 1969, Ser. No. 852,891
Claims priority, application Japan, Jan. 31, 1969, 44/6,626
Int. Cl. B01d *17/66*
U.S. Cl. 23—116 **22 Claims**

Sodium hydrosulfite is stabilized by using an aliphatic amine containing five or more carbon atoms.

3,666,410
METHOD FOR THE CONTINUOUS CRYSTALLIZATION OF SODIUM MONOSULFIDE ESSENTIALLY AS $Na_2S.5H_2O$
Yoshio Aoyama, 37 Chayamachi, Osaka, Japan; Nobuyuki Mikasa, 20–1 Aza Minamiikeda, Kawamo, Takarazuka, Japan; and Shuuzo Nakatani, 4233 Mitsu, Akitsumachi, Hiroshima Prefecture, Japan
Continuation-in-part of application Ser. No. 677,384, Oct. 23, 1967. This application Dec. 3, 1969, Ser. No. 881,908
Claims priority, application Japan, Oct. 25, 1966, 41/70,524
Int. Cl. C01b *17/22*
U.S. Cl. 23—134 **3 Claims**



Crystalline $Na_2S.XH_2O$, in which X is 6 or less, of high purity and large grain size, is produced continuously by establishing a circulation of aqueous mother liquor through a crystallizing zone and a reaction zone, which circulation always has a concentration of Na_2S, based on the water, in excess of 35% by weight, and a temperature in excess of 46° C. In the reaction zone the temperature is kept enough above 46° C. to keep crystals from forming. On the way to the crystallizing zone the liquor is cooled to a temperature close enough to 46° C. to supersaturate it, but is introduced into the crystallizer, where crystals are already present, during the short time lag before crystals commence to form. Form the top of the crystallizer most of the spent mother liquor is returned to the reaction zone, the remainder being removed with the crystals from the bottom of the crystallizer. The make-up of pure Na_2S solution is provided by reacting equimolar amounts of NaOH and NaHS in the reaction zone with the required amount of additional water. The heat of this reaction, with or without further heat, is employed in raising the temperature in the reaction zone to keep crystals from forming there. To restrict water of crystallization in the crystals to 5.5 or 5.0 moles, the process is operated at concentrations of Na_2S, based on the water, in excess of 40% and 43%, by weight, respectively, and at temperatures in excess of 50° C. and 52° C., respectively.

3,666,411
PROCESS FOR MANUFACTURE OF ALUMINA HYDRATE
Carroll Wayne Collier, 507 E. 2nd St., Harrison County, Miss. 39571
Filed Sept. 24, 1969, Ser. No. 860,762
Int. Cl. C01f *7/42*; B01j *11/06, 11/60*
U.S. Cl. 23—143 3 Claims

Preparation of particulate hydrated alumina by commingling particles of metallic aluminum and an aqueous solution of an alkali metal cyanide, tetraborate or hydroxide at a reacting temperature, the ratio of gram moles of electrolyte to gram atoms of aluminum being between about 0.1 to 1 and 1 to 1. The resulting products have an apparent bulk density of 0.2 to 0.5 gram/cc.

3,666,412
DISPERSED PHASE ACTIVATED AND STABILIZED METAL CATALYSTS
Donald M. Sowards, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 21, 1968, Ser. No. 769,059
Int. Cl. C01b *21/26, 33/20*
U.S. Cl. 23—162 11 Claims

Catalytic systems comprising a catalytic metal, such as platinum or nickel, which have dispersed therein small particles of a non-metal, such as thoria, silica, or zirconia, have been found to have good activity and durability The catalyst systems are useful in those environments where metal catalysts are conventionally used such as in ammonia oxidations and methane reforming.

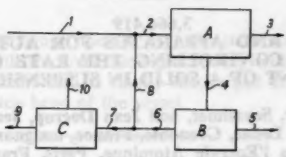
3,666,413
METHOD OF PRODUCING WET PROCESS PHOSPHORIC ACID
Ralph E. Bergstrom, Chicago, Ill., assignor to Whiting Corporation
Continuation-in-part of application Ser. No. 607,692, Jan. 6, 1967. This application Aug. 25, 1969, Ser. No. 857,276
Int. Cl. C01b *25/22*
U.S. Cl. 23—165 15 Claims

An improved method and apparatus for manufacturing wet process phosphoric acid wherein the reactants which include phosphate rock and sulfuric acid are reacted in a combination reactor and cooler unit containing a body of reaction slurry having a substantially uniform level of calcium sulfate supersaturation throughout. The body of reaction slurry is circulated in a primary flow circuit in which substantially the entire body is exposed to a subatmospheric pressure maintained in the combination reactor and cooler unit at a first rate of flow at least equal to 20% of the total mass of reaction slurry per minute and preferably from 100% to 200% of the total mass of reaction slurry per minute. Simultaneously, a portion of the body of reaction slurry is circulated through a secondary flow circuit at a flow rate not greater than 50% of the first flow rate and preferably not greater than 10% of such first flow rate. While in such secondary flow circuit, the reaction slurry is heated to increase the temperature not more than 20° F., and preferably not more than 5° F., above the average bulk temperature of the body of reaction slurry. The residence time of the reaction slurry in the secondary flow circuit during and after heating does not exceed 30 seconds and preferably is not greater than 10 seconds. The heated reaction slurry is returned to the combination reactor and cooler unit at a location at which it will be substantially instantaneously cooled by contact with said circulating body of reaction slurry contained therein, resulting in an additional heat input into said body of reaction slurry without adversely affecting the substantially uniform level of calcium sulfate supersaturation therein.

3,666,414
METHOD OF PRODUCING TRANSPARENT OR OPAQUE FUSED SILICA OR GLASS WITH A HIGH SILICON CONTENT
Otto Bayer, Burscheid, Germany, assignor to Heraeus-Schott Quarzschmelze G.m.b.H., Hanau am Main, Germany
No Drawing. Continuation of abandoned application Ser. No. 721,073, Apr. 12, 1968. This application Mar. 15, 1971, Ser. No. 124,434
Int. Cl. C03c *3/04*; C01b *33/12, 33/16*
U.S. Cl. 106—52 11 Claims

Treating the siliceous raw product for the production of transparent or opaque fused silica or of glass with a high silicon content by means of a silicon halide so as to avoid bubbles, shrink holes or the like.

3,666,415
SYNTHESIS OF AMMONIA
Alexander Harmens, Altrincham, England, assignor to Petrocarbon Developments Limited, Wythenshawe, Manchester, England
Filed Sept. 16, 1970, Ser. No. 72,570
Claims priority, application Great Britain, Sept. 30, 1969, 48,080/69
Int. Cl. C01c *1/04*
U.S. Cl. 23—199 5 Claims



In a process for the synthesis of ammonia by reaction of nitrogen with hydrogen in a reactor with recycling of unreacted gases, the hydrogen is derived from helium-containing natural gas and the impurities content of the process gas fed to the reactor is maintained constant by withdrawing a purge gas stream from the recycled gases, treating it to remove methane and argon, removing a helium-containing bleed stream before or after said treatment and returning the remainder of the purge stream to ammonia reactor.

3,666,416
MAGNESIUM HYDRIDE PRODUCTION
Walter K. Henle, Orinda, and Edgar J. Smutny, San Francisco, Calif., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Nov. 25, 1970, Ser. No. 92,900
Int. Cl. C01b *6/04*
U.S. Cl. 23—204 6 Claims

Magnesium hydride having high-surface area and high-chemical activity is produced by hydrogenating a mixture of magnesium and a conjugated diene in the presence of tetrahydrofuran.

3,666,417
PROCESS FOR PRODUCTION OF CARBON FIBERS
Tadashi Araki, Hitoshi Takita, and Kiro Asano, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
No Drawing. Filed May 15, 1970, Ser. No. 37,865
Claims priority, application Japan, May 17, 1969, 44/37,725
Int. Cl. C01b *31/07*
U.S. Cl. 23—209.1 5 Claims

A process for the manufacture of superior carbon or graphite fibers from polymethyl vinyl ketone, as raw material, which comprises the steps of melt-spinning fibers

therefrom, stretch-orienting the fibers in the axial direction thereof cyclizing the compound material constituting the fibers by dehydration, and carbonizing the cyclized fibers. The carbon fibers thus obtained are readily convertible into graphite fibers by a simple additional process of graphitization. Desirably, the cyclized polymethyl vinyl ketone fibers are then denatured as to have sufficient heat resistivity to undergo the ensuing step of carbonization without suffering either degasification or deformation.

3,666,418

SULPHUR EXTRACTION PROCESS

Hans Joachim Wernicke, Neuenhain, Taunus, Fuchshohl, and Hermann Reitzenstein, Aschau, Chiemgau, Germany, assignors to Messer Griesheim G.m.b.H., Frankfurt am Main, Hanauer Landstrasse, and Uhde, Friedrich G.m.b.H., Dortmund, Germany

Filed Aug. 17, 1970, Ser. No. 64,206
Claims priority, application Germany, Aug. 16, 1969, P 19 41 703.9
Int. Cl. C01b *17/04*
U.S. Cl. 23—225 P 4 Claims

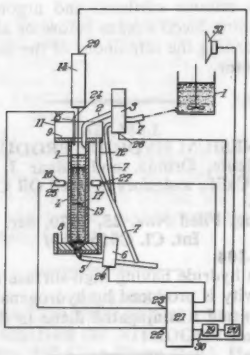
A process for obtaining sulphur from hydrogen sulphide containing gases by the reaction of said gases with sulphur dioxide thereby producing sulphur and water. The necessary amount of sulphur dioxide is produced by the combustion of sulphur with oxygen or an oxygen rich gas.

3,666,419

METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING THE RATE OF SETTLEMENT OF A SOLID IN SUSPENSION IN A LIQUID

Paul Cahour, Seyssimet, and Jean Decrop, Jean Holder, and Alain Ledac, Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 21, 1968, Ser. No. 769,120
Claims priority, application France, Oct. 24, 1967, 125,669
Int. Cl. G01n *15/04, 11/00*
U.S. Cl. 23—230 10 Claims



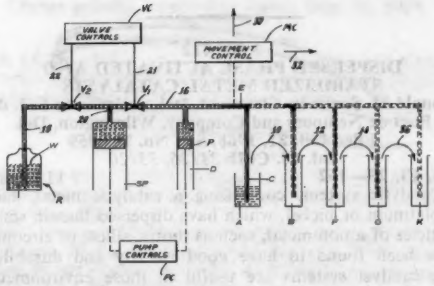
Method and device for automatically controlling the rate of settlement of a solid in suspension in a liquid medium, in particular of a precipitate formed in the liquid medium, as a consequence of a continuous chemical reaction. Parts of the suspension are periodically drawn off from said medium and delivered to a settlement cell to be subjected to a cycle of operations which comprises stopping the above delivery when the suspension has reached a set level in the cell, measuring the settling time of the interface of the precipitate and of the supernatant liquid which forms in the suspension at rest, between an upper set level and a lower set level in said cell, and discharging of the suspension from the cell.

3,666,420

APPARATUS FOR AUTOMATICALLY CARRYING OUT CHEMICAL ANALYSES

Peter Paatzsch, Hildegardring, Germany, assignor to Bodenseewerk Perkin-Elmer & Co. G.m.b.H., Uberlingen (Bodensee), Germany

Filed Nov. 9, 1970, Ser. No. 87,956
Int. Cl. F16k *19/00*; G01n *1/14*
U.S. Cl. 23—253 R 2 Claims



A measuring sample transfer or "dosing" device for use in an automatic analysis apparatus of the type in which each of a series of sample vessels contains a different liquid sample, and measured amounts of sample from each sample vessel are to be transferred into a plurality of reaction vessels associated with each such sample vessel. The disclosed sample "dosing" device includes a first sample measuring pump directly connected to the sample intake (and discharge) line (which is to be introduced into a sample vessel to take up sample and then into each of its associated reaction vessels in turn to discharge a measured amount of the sample), and is connected by a separate supply line having a first and second control valve to a supply of wash liquid (or reagent); and a (second) scavenging pump is connected to this supply line at a point intermediate these two valves. With the system filled with wash liquid but both pumps in their discharge (empty) position, the first valve is closed and the (first) measuring pump sucks up sample from the sample vessel through its intake line, while the scavenging pump is filled with wash liquid by means of the supply line. If the sample intake line is of greater volume than the intake stroke of the sample pump, then no sample reaches the pump itself. The intake line is then introduced into each associated reaction vessel in turn and a measured amount of sample is discharged in each such reaction vessel. Finally, the first valve is opened while the second valve is closed, a discharge of the scavenging pump clears the intake line of any residual sample (either into the last reaction vessel or an additional waste vessel). The cycle than may be repeated for the next sample vessel without danger of contamination by the sample just transferred.

3,666,421

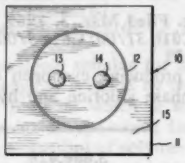
DIAGNOSTIC TEST SLIDE

Richard Thompson Price, Verona, N.J., assignor to Organon, Inc., West Orange, N.J.

Continuation-in-part of abandoned application Ser. No. 818,366, Apr. 22, 1969. This application Apr. 5, 1971, Ser. No. 131,172
Int. Cl. G01n *33/16*
U.S. Cl. 23—253 TP 20 Claims

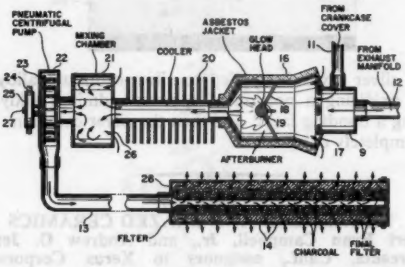
A test slide for the performance and observation of an immunochemical or diagnostic test on its surface, which

surface is insoluble in, impermeable to, non-absorbent to, and wettable by, water, carries on the surface at least one circumscribed test area containing in close proximity at least two deposited solid dried immunochemical re-



agents providing an accurate predetermined amount of an antigen and an antibody, which upon moistening with a liquid to be tested are reconstituted to the test reagents and then united to form a spot of reaction mixture.

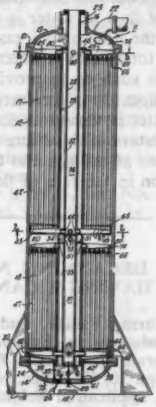
3,666,422
POLLUTION CONTROL SYSTEM
Joseph Rossel, 253 10th Ave., New York, N.Y. 10001
Filed Feb. 12, 1971, Ser. No. 114,925
Int. Cl. F01n *3/14*
U.S. Cl. 23—277 C **6 Claims**



A pollution control system for connection to the exhaust of an automobile or heating plant consuming fossil fuels consisting of an afterburner compartment including a glow head disposed within the afterburner compartment for igniting unburned exhaust gases. The afterburner compartment also includes an air inlet to permit oxygen to mix with the unburned exhaust gases to aid in their ignition. At the output of the afterburner compartment is included a cooling and mixing chamber so that the exhaust gases can be fed into a pneumatic pump where they will be applied to a filtering system preferably consisting of charcoal before the gas enters into the atmosphere.

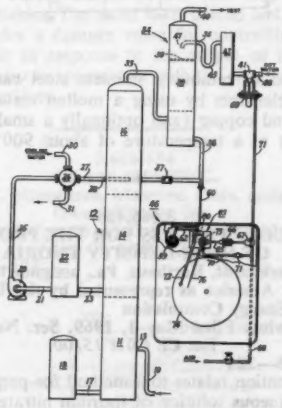
3,666,423
HEAT EXCHANGE APPARATUS
James R. Muenger, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.
Filed Nov. 26, 1969, Ser. No. 880,255
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 L **3 Claims**

A heat exchange apparatus for a catalytic system comprising a closed cylindrical vessel containing an axial spine which extends substantially the length of said vessel, and a heat exchange means which is embedded in catalyst within said vessel, and is supported by said axial spine on a removable unit and is in communication therewith. Fresh feed gas is introduced into and discharged from said heat exchange means by way of said axial spine, finally being discharged into a chamber at the bottom of the vessel. The preheated feed gas stream is then passed from the bottom of the chamber up through the catalyst on the outside of



said heat exchange means in indirect concurrent heat exchange with the fresh feed gas flowing within the heat exchange means and is finally discharged from an exit port in the top head of the vessel.

3,666,424
CONSTANT CONCENTRATION HYDROCHLORIC ACID BY VARYING WATER FEED PROPORTIONALLY TO TEMPERATURE
Ernest H. Cox, Long Branch, N.J., assignor to Tenneco Chemicals, Inc.
Filed Apr. 5, 1968, Ser. No. 719,060
Int. Cl. C01b *7/08*; B01d *11/00*
U.S. Cl. 23—312 R **3 Claims**



The present invention relates to a novel method of producing aqueous hydrochloric acid at a substantially constant concentration despite variations in the rate of flow of hydrogen chloride feed gas. The gas flows continuously into and through an initial body of concentrated aqueous

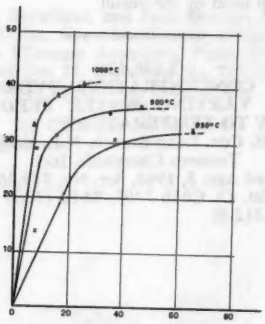
hydrochloric acid in an absorption column in which a portion of the gas is dissolved with the remainder of the gas being discharged as tail gas. The concentrated acid is cooled and maintained at a constant temperature that will provide the desired concentration of acid which is continuously discharged as product. The unabsorbed gas (tail gas) is flowed together with water to form dilute acid fed to the absorption column containing concentrated acid. The normal rate of flow of water is varied in accordance with variations in the flow of tail gas from a normal rate of flow so that the total amount water flowing into contact with the tail gas is such as to provide a product of the desired concentration. In a preferred embodiment, the rate of flow of water is varied in accordance with variations in the temperature of the dilute acid caused by variations in the amounts of tail gas and the heat generated as a result of variation in the rate of flow of feed gas.

3,666,425

METHOD OF DECANNING NUCLEAR FUEL ELEMENTS HAVING A CAN OF STAINLESS STEEL

Joseph-Gerard Wurm, Varese, and Maurice Payrissat, Ispra, Italy, assignors to European Atomic Energy Community (Euratom), Brussels, Belgium

Filed Sept. 30, 1968, Ser. No. 763,519
Claims priority, application Belgium, Oct. 31, 1967, 50,315
Int. Cl. C22b *61/04*
U.S. Cl. 23—324 **4 Claims**



A method of removing stainless steel cans from nuclear fuel elements by using a molten metal solvent of antimony and copper (and optionally a small amount of manganese) at a temperature of about 900° C.

3,666,426

CONTINUOUS PROCESS FOR THE PRODUCTION OF HIGH-DENSITY THORIA

Winston Burkhardt, Karthaus, Pa., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed May 1, 1969, Ser. No. 821,110
Int. Cl. C01f *15/00*
U.S. Cl. 23—328 **1 Claim**

This invention relates to a method for preparing thoria from an aqueous solution of thorium nitrate which comprises mixing said solution with an aqueous basic solution of ammonia continuously at a temperature in the range 180–200° F. under such conditions that the pH of the resulting slurry as would be measured at 25° C. is at a value in the range 5.0–6.5, and then filtering the resultant precipitate.

3,666,427

PROCESS FOR THE PRODUCTION OF CYANOGEN CHLORIDE TOGETHER WITH CYANURIC CHLORIDE AND TETRAMERIC CYANOGEN CHLORIDE

Edgar Enders, Cologne, Flittard, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 3, 1969, Ser. No. 803,988
Int. Cl. C01b *31/00*; C01c *3/00*; C07c *119/00*
U.S. Cl. 23—359 **11 Claims**

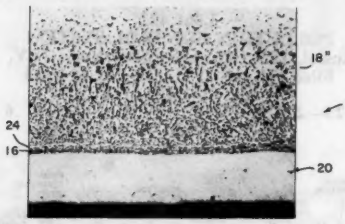
Process for producing cyanogen chloride by reacting in the liquid phase chlorine and hydrocyanic acid.

3,666,428

SILVER-CADMIUM OXIDE ELECTRICAL CONTACT MATERIALS

Frederick O. Haarbye, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation-in-part of appliccation Ser. No. 722,956, Apr. 22, 1968. This application Mar. 9, 1970, Ser. No. 17,456
Int. Cl. C22c *5/00*; H01h *1/02*
U.S. Cl. 29—195 **8 Claims**



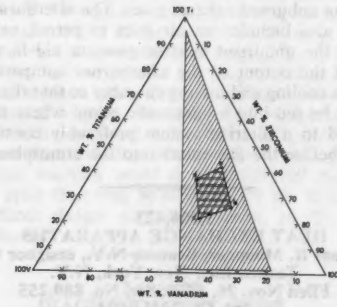
A silver layer is applied to silver-cadmium alloys by first oxidizing a portion of a silver-cadmium alloy, applying a bonding layer, and then the silver-cadmium alloy is completely oxidized.

3,666,429

METALLIZED AND BRAZED CERAMICS

Albert Evan Campbell, Jr., and Andrew O. Jensen, Arcadia, Calif., assignors to Xerox Corporation, Rochester, N.Y.

Continuation-in-part of application Ser. No. 646,186, June 15, 1967. This application Sept. 29, 1969, Ser. No. 861,976
Int. Cl. B32b *15/00*
U.S. Cl. 29—195 **4 Claims**

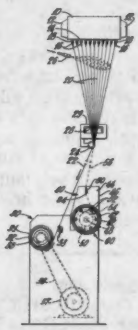


A process for metallizing high purity ceramic parts and/or brazing a high purity ceramic part to a refractory metal part or another ceramic part using a ternary titanium, vanadium, and zirconium alloy is described. A particularly efficacious alloy comprising 21–42% titanium, 15–33% vanadium and 36–54% zirconium yields hermetic seals when parts are bonded in accordance with the process described herein.

3,666,430
GELLED ORGANIC LIQUIDS
Desmond Wilfrid John Osmond, Windsor, and Frederick Andrew Waite, Slough, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed June 17, 1968, Ser. No. 737,395
Claims priority, application Great Britain, June 20, 1967, 28,446/67
Int. Cl. C10l 7/02
U.S. Cl. 44—7 D 10 Claims

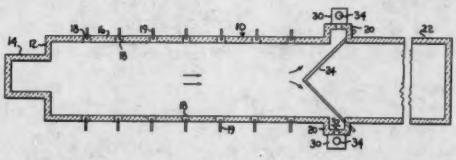
Gelled hydrocarbon liquid suitable for use as a fuel in internal combustion engines is made by incorporating in the liquid polymeric material which is solvated by the liquid and contains polar groups which form associative bonds and so produce a crosslinked polymer structure. The associative bonds can be broken and re-made without changing the nature of the polar groups and so the gelled liquid will flow on being subjected to mechanical treatment, such as pumping, and will revert to the gelled state on cessation or shortly after cessation of the mechanical treatment.

3,666,431
APPARATUS FOR ADVANCING GLASS FIBERS
Leo Alex Oswald, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation
Filed Nov. 10, 1969, Ser. No. 875,176
Int. Cl. C03b 37/00
U.S. Cl. 65—11 W 12 Claims



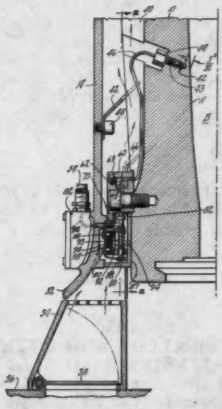
Apparatus for handling linear material such as a glass strand including a rotatably mounted member with spaced apart circumferentially disposed fingers on the member extending generally parallel to the member's axis of rotation and upon which the linear material collects as the member rotates.

3,666,432
PROCESS AND APPARATUS FOR SEPARATING FOAM FROM A MOLTEN BODY OF GLASS
Gerald E. Kunkle, New Kensington, Pa., and William E. Heidish, Huntsville, Ala., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 758,726, Sept. 10, 1968. This application Mar. 11, 1971, Ser. No. 123,297
Int. Cl. C03b 5/20
U.S. Cl. 65—27 8 Claims



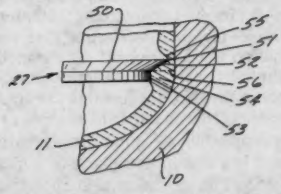
In melting high-temperature glass with volatile components such boron trioxide, there is used a furnace with a skimmer that comprises a water-cooled pipe in contact with the glass, the furnace also having means to withdraw the material retained behind the skimmer. The water-cooled pipe is positioned at an angle with respect to the side walls of the furnace; preferably two such pipes are used, such to form a V with its apex uptank, within the firing zone of the furnace. The invention provides an unobvious solution to a problem concerning the production of a sodium-boron glass for aircraft use.

3,666,433
MOLD HOLDER WITH THERMOSTATICALLY CONTROLLED MOLD
Hermann H. Nebelung, Binz-Maur, and Eginhard Jaeger, Weiningen, Switzerland, assignors to Emhart Corporation, Bloomfield, Conn.
Filed July 8, 1970, Ser. No. 53,172
Int. Cl. C03b 9/34
U.S. Cl. 65—158 5 Claims



In a glassware forming machine of the Hartford I.S. type, a split blank mold is provided wtih a thermocouple type temperature sensor and the mold carries a lead-out wire and a plug part which mates with a complementary plug part and leadout wire on the mold holder to provide a signal for a control system. The plug parts not only locate one another during assembly, but also help locate the mold in the holder. The mold is air cooled and the control system includes a damper valve for controlling the flow of cooling air in response to the output of the thermocouple, and also in accordance with the closing movement of the mold holders.

3,666,434
GLASS SHAPING
Lester C. Minneman, Maumee, Ohio, assignor to Owens-Illinois, Inc.
Filed Nov. 30, 1967, Ser. No. 686,920
Int. Cl. C03b 33/10
U.S. Cl. 65—177 2 Claims



An improvement in cathode-ray tube forming techniques wherein a glassworking tool, employed in conjunction

with a centrifugal casting operation, is provided with a glass plowing surface to facilitate the formation of a wide annular seal edge on the funnel member.

3,666,435
PHOSPHORYLATED HETEROCYCLIC COMPOUNDS AS HERBICIDES

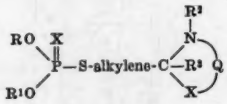
Glenn R. Price and Edward N. Walsh, Chicago Heights, Ill., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Dec. 28, 1964, Ser. No. 421,609, now Patent No. 3,580,922, dated May 25, 1971. Divided and this application Nov. 28, 1969, Ser. No. 879,948

Int. Cl. A01n *9/36*

U.S. Cl. 71—87 6 Claims

Method of controlling plant life with phosphorylated heterocyclic compounds of the formula



wherein R and R' are lower alkyl; X is oxygen or sulfur; R^3 is H, lower alkyl; R^3 is H, alkyl of 1 to 3 carbon atoms; and Q is ethylene, propylene or phenylene.

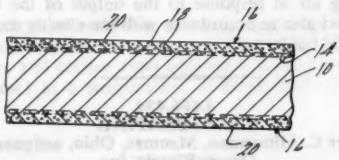
3,666,436
CERMET-TYPE ALLOY AND METHOD OF MAKING SAME

Nikolajs Bredzs, Detroit, and Forbes M. Miller, Dearborn, Mich., assignors to Wall Colmonoy Corporation

Application Feb. 19, 1969, Ser. No. 800,540, now Patent No. 3,547,673, dated Dec. 15, 1970, which is a continuation-in-part of application Ser. No. 646,654, June 16, 1967. Divided and this application July 7, 1969, Ser. No. 871,123

Int. Cl. B22f *9/00*; C22c *1/10*

U.S. Cl. 75—.5 R 10 Claims



An improved cermet-type alloy and method of making same which is particularly adaptable for forming protective surface coatings on heat-resistant alloys. A particulated mixture is formed containing titanium and/or zirconium reactive metal constituents that undergo an exothermic reaction upon fusion at an elevated temperature in a substantially inert atmosphere with silicon and/or boron present in the mixture forming the corresponding silicides or borides of the reacted metals in situ which are subsequently precipitated as a uniformly dispersed discontinuous phase in a continuous phase of a nickel and/or cobalt base matrix. The invention also encompasses novel powder compositions for exothermically forming the cermet-type alloys and coatings.

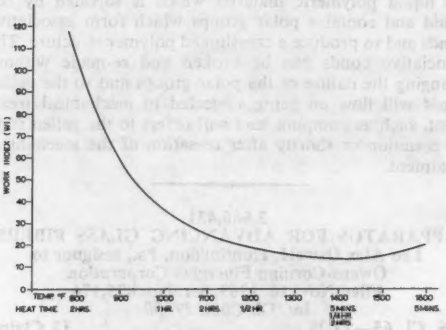
3,666,437
TREATMENT OF IRON-NICKEL-CHROMIUM ALLOY SCRAP TO FACILITATE RECOVERY OF METAL VALUES BY LEACHING

Ernest Mehl, Fort Saskatchewan, Alberta, Michael Kohut, Edmonton, Alberta, and Paul Kawulka, Fort Saskatchewan, Alberta, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed Nov. 24, 1969, Ser. No. 879,302

Int. Cl. B22f *9/00*; C22b *23/04*

U.S. Cl. 75—.5 BA 8 Claims



Nickel, iron and chromium containing alloy scrap is treated to facilitate recovery of nickel and other contained non-ferrous metal values, such as cobalt and copper, by grinding and leaching. The alloy scrap is converted to a low-sulphur matte and then shotted. The shot is then heated in a neutral, oxidizing or reducing atmosphere at temperature in the range of 800° F. to 1700° F. for a period of time sufficient to substantially improve the grindability thereof. Preferably the heating is conducted at 1400° F. for 30 minutes.

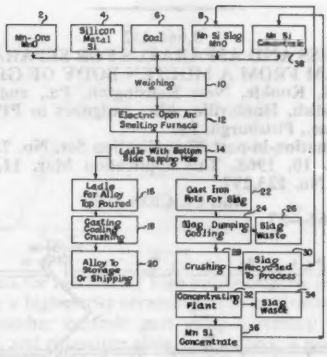
3,666,438
PROCESS FOR THE PRODUCTION OF MANGANESE-SILICON ALLOY

Ivo Madronic, Marietta, Ohio, and Akgun Mertdogan, Homewood, Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed Nov. 16, 1970, Ser. No. 89,904

Int. Cl. C22d *7/06*

U.S. Cl. 75—10 9 Claims



A process for the production of a manganese-silicide alloy having a low carbon content including smelting manganese ore, silicon metal and a manganese-silicon slag in

an electric furnace with sufficient carbonaceous reductant to provide a melt of manganese-silicide alloy and a throw-away slag, introducing the melt into a ladle, and then separately removing the alloy and throw-away slag from the ladle. The carbon is used as an exclusive reducing agent and the silicon is used only for alloying purposes. In the invention, the throw-away slag contains manganese values and is recycled, thus making possible the direct use of manganese ore as the manganese bearing material.

3,666,439

METHOD OF DECARBURIZING ALLOY STEELS

Sundaresan Ramachandran, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,914
Int. Cl. C21c *7/10, 5/32, 5/34*
U.S. Cl. 75—49 7 Claims

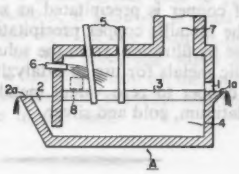
A control method for decarburizing alloy steels such as stainless steel initiated with a reduced flow of diluent gas such as argon. The composition of the effluent gases issuing from the decarburization vessel are monitored to provide an indication of the undesirable oxidation of certain metallic values within the bath being decarburized, such as chromium. The method includes maximizing the flow and thus, the conversion of oxidizer to carbon monoxide and minimizing the flow of the diluent gas in order to promote economy of operation. The concept contemplates increase in the flow of diluent gas upon the observance of excessive oxidation of metallics to promote the maximum oxidation in the carbon within the bath.

3,666,440

METHOD OF RECOVERING COPPER FROM SLAG

Hiroshi Kono, Kagawa-gun, and Takeyoshi Shibazaki, Urawa, Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Mar. 13, 1970, Ser. No. 19,260
Int. Cl. C22b *9/10, 15/14*
U.S. Cl. 75—76 5 Claims



Copper is recovered from copper-containing slag by putting the matte and slag in a molten state together in a slag treating furnace at a volume ratio of more than 1:5, the melts in the furnace being maintained under agitation so that the slag and matte are in intimate contact so as to efficiently transfer copper from the slag to the matte.

3,666,441

PROCESS FOR DECOPPERIZING LEAD

Geoffrey Milner, Stockton-on-Tees, England, assignor to The Power-Gas Corporation Limited, Teesside, England

Continuation-in-part of application Ser. No. 433,651, Feb. 18, 1965. This application Nov. 8, 1968, Ser. No. 774,300
Int. Cl. C22b *13/06*
U.S. Cl. 75—78 12 Claims

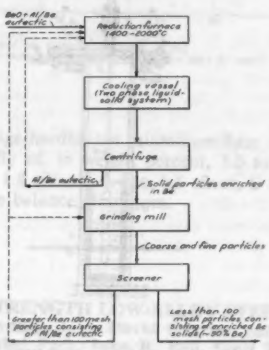
Decopperizing lead bullion, particularly lead bullion containing more than 2% copper, by adding to the molten lead bullion a sulfur containing compound sufficient to react with the copper to produce cuprous sulfide, allowing the reaction mixture to settle into a first lower layer of molten lead bullion of reduced copper content and an an upper layer of matte containing cuprous sulfide and lead sulfide. Thereafter, the molten lead bullion is isolated and cooled to form a further upper layer of matte containing cuprous sulfide and lead sulfide and a further lower layer of molten lead bullion of further reduced copper content and the latter is then isolated.

3,666,442

PREPARATION OF BERYLLIUM

Gilbert S. Layne and James O. Huml, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 26, 1968, Ser. No. 779,106
Int. Cl. B03b *9/04*; C22b *7/00*
U.S. Cl. 75—84 10 Claims


BeO + Al/Be eutectic
Reduction furnace 1400 –2000°C
Cooling vessel (Two phase liquid-solid system)
Centrifuge
Al/Be eutectic
Solid particles enriched in Be
Grinding mill
Coarse and fine particles
Screener
Greater than 100 mesh particles consisting of Al/Be eutectic
Less than 100 mesh particles consisting of enriched Be solids (~50% Be)

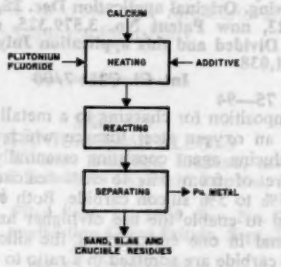
A method for preparing a beryllium enriched material which comprises: comminuting an aluminum-beryllium alloy to obtain a coarse particulate fraction of an aluminum-beryllium eutectic composition and a fine particulate fraction comprising beryllium; and separating the coarse particulate fraction from the fine particulate fraction.

3,666,443

PLUTONIUM PRODUCTION

William V. Conner, Nederland, Colo., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 5, 1969, Ser. No. 874,190
Int. Cl. C22b *61/04*
U.S. Cl. 75—84.1 1 Claim



The process for the reduction of plutonium fluorides to plutonium metal comprising heating to the reaction temperature a mixture of plutonium fluorides and calcium

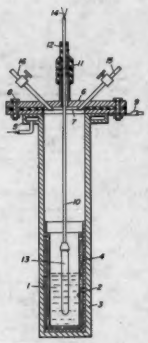
metal together with an additive selected from the group consisting of magnesium fluoride and calcium chloride, allowing the mixture to react to form a plutonium metal button, and physically separating the plutonium metal button from the reaction slag.

3,666,444

ELECTROWINNING OF BERYLLIUM

Morton M. Wong, Reno, Nev., assignor to the United States of America as represented by the Secretary of the Interior

Filed Dec. 5, 1968, Ser. No. 781,445
Int. Cl. C22b *35/00*; C22d *3/10*
U.S. Cl. 75—84.4 11 Claims



A method of electrowinning beryllium from a fused salt electrolyte containing beryllium fluoride comprising electrolyzing at a temperature below the melting point of the beryllium, followed by heating a mixture of the fused salt and beryllium metal to a temperature above the melting point of beryllium to coalesce the beryllium. The beryllium metal finds utility in a variety of applications where high melting temperature, light weight, high strength, good thermal conductivity, low thermal neutron absorption cross section, and high scattering cross section are required, e.g., in space vehicles and nuclear reactors.

3,666,445

AUXILIARY COMPOSITION FOR STEEL-MAKING FURNACES

Joseph K. Stone and Peter J. Beck, Berkeley, and Edward J. Prince, Oakland, Calif., assignors to Kaiser Industries Corporation, Oakland, Calif.

No Drawing. Original application Dec. 26, 1967, Ser. No. 693,123, now Patent No. 3,579,325, dated May 18, 1971. Divided and this application July 13, 1970, Ser. No. 61,038
Int. Cl. C21c *7/00*
U.S. Cl. 75—94 10 Claims

A composition for charging to a metallurgical furnace, such as an oxygen steel furnace which is a heat- and flux-producing agent consisting essentially of a granular admixture of from 5% to 95% calcium carbide and from 95% to 5% silicon carbide. Both components provide fuel to enable the use of higher amounts of scrap metal; and in one embodiment the silicon carbide and calcium carbide are admixed in a ratio to give an eventual slag of suitable lime-silica ratio. The admixture of silicon carbide and calcium carbide is advantageously admixed with a minor amount of a hydrocarbon bonding agent which is at least semi-solid at ordinary room temperatures, such as tar or pitch, and formed into compacts, e.g. pellets or briquettes. Powdered aluminum metal can also be incorporated.

3,666,446

PROCESS FOR SOLVENT EXTRACTION OF METALS

Lorne F. Cook, Hockessin, and Wallace W. Szmokaluk, New Castle, Del., assignors to The Pyrites Company, Inc., Wilmington, Del.

Filed Nov. 12, 1969, Ser. No. 875,676
Int. Cl. C22b *23/04, 15/00*
U.S. Cl. 75—101 BE 13 Claims

Solvent ion exchange reaction in which the pH of the metal-bearing liquor is regulated by an ion exchange reaction where hydrogen ions in the aqueous liquor are exchanged for metal cations in an ion extractant. Process enables loading an ion extractant with metals in the metal-bearing liquor without interstage pH adjustment. The loaded ion extractant is treated with a ligand to strip the extractant and render it capable of reuse.

3,666,447

REMOVAL AND RECOVERY OF COPPER FROM SUBSTANTIALLY CYANIDE-FREE ALKALINE WASTE SOLUTIONS

Edward B. Saubestre, Hamden, Conn., assignor to Enthone, Incorporated, New Haven, Conn.

No Drawing. Filed Mar. 25, 1970, Ser. No. 22,679
Int. Cl. C22b *15/12*
U.S. Cl. 75—108 1 Claim

Process for the removal of substantially all copper from a substantially cyanide-free alkaline waste solution containing ionic copper, a reducing agent, for example formaldehyde, for the ionic copper which is added to the solution if not already present therein, and usually a complexing agent for the ionic copper. The process also provides for the recovery of marketable zero valent metallic copper. The alkaline waste solution is contacted with a material or metal catalytic to the reduction of the ionic copper by the reducing agent to zero valent metallic copper, and the catalytic contacting continued until the desired amount of copper is precipitated as zero valent metallic copper. The metallic copper precipitate is then separated, for instance by filtration, from the solution. Exemplary of the catalytic metals for use in catalyzing the reduction of the ionic copper to zero valent metallic copper are palladium, platinum, gold and silver.

3,666,448

COPPER/IRON/ALUMINIUM ALLOYS

Robert James Goodwin, Hadleigh, and Geoffrey Greetham, Ipswich, England, assignors to National Research Development Corporation, London, England

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,632
Claims priority, application Great Britain, Nov. 5, 1968, 52,338/68
Int. Cl. C22c *9/06, 39/02*
U.S. Cl. 75—122 5 Claims

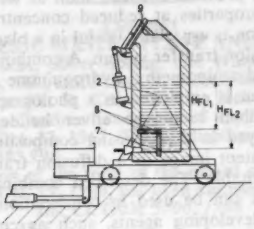
Copper/iron/aluminium alloys of the basic composition (weight percentage) 35 to 75 copper, 20 to 50 iron and 5 to 15 aluminium and comprising a matrix of a copper-rich solid solution phase which contains a dispersed iron-rich solid solution phase, have at least one alloy element additionally present to ennoble the iron-rich phase and/or to provide an adherent protective film on the iron-rich phase. Additions selected from the group nickel, chromium, tungsten, molybdenum and cobalt, are more likely to act as ennobling elements and those selected from the group titanium, niobium, tantalum, zirconium and silicon, are more likely to be film-forming agents. Preferably not

more than about 15 percent of each additive element is present. In the case of nickel, the range of 3 to 12 (weight) percent is preferred and in the case of chromium, 3 to 9 (weight) percent is preferred.

3,666,449
METHOD FOR THE INTRODUCTION OF VOLATILE ADDITIVES INTO A MELT

Anton Alt, Mettmann, Germany, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Jan. 22, 1969, Ser. No. 793,065
Claims priority, application Switzerland, Jan. 26, 1968, 1,274/68; Dec. 3, 1968, 17,961/68
Int. Cl. C21c *1/08, 1/10, 7/02*
U.S. Cl. 75—130 B **12 Claims**



Introduction of vaporizable additives, such as magnesium, into an iron melt in which the vaporization is initiated by a tilting movement of a treatment vessel. The vaporizable material is contained in a separate compartment which can be externally charged and which, in one position of the vessel segregates the additive from the melt, but on tilting the vessel, permits communication with the melt through openings located at different levels. The vapor bubbles formed ascend through the melt with such a size and in such a number that at least a portion of the bubbles escape from the surface of the melt. The vapor bubbles have a great surface area to provide, for example with magnesium, a yield of at least 30% and preferably more than 40% of the additive in the melt while the velocity of the ascending vapor bubbles is such as to produce a flushing action on the melt resulting in a reduction of the reaction products and residual undesirable impurities in the melt.

3,666,450
PHOTOCONDUCTIVE TERNARY ALLOY OF CADMIUM, SELENIUM AND MERCURY

Tadao Nakamura, Shigeaki Nakamura, and Tadao Kohnashi, Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

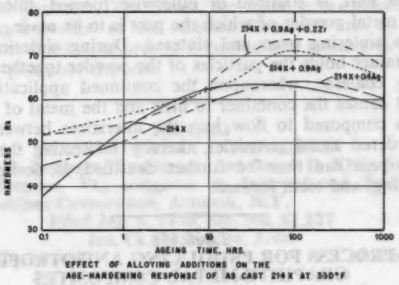
Filed Mar. 10, 1970, Ser. No. 18,248
Claims priority, application Japan, Mar. 14, 1969, 44/21,073
Int. Cl. C22c *7/00, 17/00*
U.S. Cl. 75—134 H **8 Claims**

A novel photoconductive crystalline ternary alloy prepared from a host material containing cadmium, selenium and mercury and doped with an activator and coactivator, said host material being fired at least once until the crystallization thereof is complete and a photosensitivity peaking up in the infrared spectral range is attained. The activator is selected from any of I*b* group elements consisting of copper and silver, and the coactivator is selected from any of VII*b* group elements consisting of chlorine, bromine and iodine or from any of III*b* group elements consisting of aluminum, gallium and indium.

3,666,451
ALUMINUM ALLOY

Henry Dale Bewley, Paducah, Ky., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 13, 1970, Ser. No. 63,457
Int. Cl. C22c *21/02*
U.S. Cl. 75—147 **2 Claims**



EFFECT OF ALLOYING ADDITIONS ON THE AGE-HARDENING RESPONSE OF AS CAST 214 X AT 350°F

A castable, age-hardenable, aluminum-base alloy consisting essentially of, in weight percent, 3.0 to 4.5 magnesium, 0.6 to 1.8 silicon, 0.4 to 1.5 silver, 0 to 0.5 zirconium, and the balance aluminum.

3,666,452
HIGH-STRENGTH LOW-ALLOY STEELS

Michael Korchynsky, John David Grozier, and John L. Mihelich, Bethel Park, John R. Bell, Scott Township, Allegheny County, and Leon Luyckx, Peters Township, Washington County, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

No Drawing. Filed July 16, 1969, Ser. No. 842,345
Int. Cl. C22c *39/50, 39/54;* C21d *7/14*
U.S. Cl. 75—123 E **6 Claims**

Fully killed high-strength low-alloy steels consisting essentially of .12% to .20% carbon, 1.10% to 1.65% manganese, .05% to .20% vanadium, .005% to .025% nitrogen, .04% maximum phosphorus, .025% maximum sulfur, .60% maximum silicon and balance iron are characterized in a hot-rolled finished condition by yield strengths in excess of 80,000 p.s.i., ultimate tensile strengths in excess of 95,000 p.s.i., ductilities as measured by percent elongation (2 inches) in excess of 18% and good toughness. The steels are hot-rolled finished in the temperature range 1550° F. to 1650° F., cooled at a rate within the range 20° F. to 135° F. per second and collected by coiling or piling within a temperature range of 1025° F. to 1175° F. The steels modified by the incorporation of .01% to .10% of a rare earth are further characterized by improved formability.

3,666,453
TITANIUM-BASE ALLOYS

Richard Ernest Goosey, Aldridge, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

No Drawing. Filed Sept. 11, 1970, Ser. No. 71,331
Claims priority, application Great Britain, Sept. 24, 1969, 47,049/69
Int. Cl. C22c *15/00*
U.S. Cl. 75—175.5 **9 Claims**

Creep resistant titanium alloys containing aluminium, zirconium, tin, silicon, hafnium and optionally molybdenum and beta stabilisers.

3,666,454
METHOD OF MAKING LARGE SINTERED POWDERED METAL PARTS WITHOUT DIES
Myron C. Sarnes, Northville, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.
Filed Dec. 4, 1970, Ser. No. 95,266
Int. Cl. B22f *3/10*
U.S. Cl. 75—200 3 Claims

A container of infiltratable metal, such as brass or copper, and of the approximate shape desired for the finished part, is stamped or otherwise formed, filled with the metal powder of which the part is to be made, placed in a sintering oven and sintered. During sintering, the container holds the particles of the powder together until they coalesce, whereupon the continued application of heat causes the container to melt and the metal of which it is composed to flow into the interstices between the powdered metal parrticles, thereby infiltrating the part. The part can then be further densified, if desired, by forging, and teeth formed.

3,666,455
PROCESS FOR PRODUCING ANISOTROPIC GRAPHITE-METAL COMPOSITES
Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Original application Mar. 22, 1965, Ser. No. 441,905, now Patent No. 3,492,197, dated Jan. 27, 1970. Divided and this application Nov. 12, 1968, Ser. No. 775,107
Int. Cl. B22f *7/00*
U.S. Cl. 75—201 5 Claims

An anisotropic graphite-metal composite of vermicular expanded graphite containing from 5 to 75 weight percent, based on the total weight of the composite, of a metal powder having a particle size less than 100 mesh and compressed to a density of 10 to 120 pounds per cubic foot. Such composites are prepared by admixing vermicular expanded graphite with from 5 to 75 weight percent of silver, copper, nickel, zinc, lead, silicon, iron or boron having a particle size of less than 100 mesh and compressing the mixture to a density of from 10 to 120 pounds per cubic foot. To achieve additional strength the compressed composite is heated to sinter the metal powder.

3,666,456
METHOD OF MAKING COMPOSITE WEAR RESISTANT ARTICLES, SUCH AS FACE SEALS
John Haller, Northville, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.
Original application Aug. 4, 1969, Ser. No. 847,183, now Patent No. 3,594,011. Divided and this application Sept. 14, 1970, Ser. No. 71,899
Int. Cl. B22f *5/00*
U.S. Cl. 75—208 5 Claims

A shallow groove in the flange of an annular radially-flanged briquette of powdered base metal, such as powdered iron, is filled with powder of a wear-resistant metal alloy of high retentive hardness, and this assembly heated to a sufficiently high temperature to simultaneously sinter the base metal briquette and melt the superalloy type powder, which thereupon bonds itself with the iron. The periphery of this composite body is then ground away to expose the superalloy type metal alloy and then finish-machined on its annular face to grind away the edges of the groove and reduce them to the level of the surrounding base metal, a slight inward taper being preferably imparted to the inner part of the hard metal portion.

In a modification, a separate annular briquette of metal alloy powder of wear-resistant high-retentive hardness is prepared in a size adapted to mate with the groove of the base metal briquette and inserted therein. Thereupon the base metal briquette and the hard metal insert are simultaneously heated to sinter the iron powder briquette and melt the hard metal alloy so that it bonds itself to the sintered powdered iron base metal. The resulting annular blank is then machined by grinding as in the principal form of the invention.

3,666,457
PHOTOGRAPHIC PRODUCT, COMPOSITION AND PROCESS
Mary J. Youngquist, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Oct. 2, 1969, Ser. No. 863,361
Int. Cl. G03c *1/42, 5/54*
U.S. Cl. 96—29 R 18 Claims

A combination of a reductone silver halide developing agent such as an anhydro dihydro amino reductone silver halide developing agent, with an aminomethyl hydroquinone silver halide developing agent, such as 2-methyl-5-morpholinomethyl hydroquinone or 2-methyl-5-piperidinomethyl hydroquinone, in a photographic diffusion transfer system provides reduced stain as well as desired sensitometric properties at reduced concentration levels. This combination is especially useful in a black and white silver salt diffusion transfer system. A combination wherein the described aminomethyl hydroquinone silver halide developing agent is employed in a photographic element and the described reductone silver halide developing agent is employed in a processing composition used for developing a latent image in a diffusion transfer system is especially suitable. The described combination of developing agents can be used in combination with other photographic developing agents, such as cinnamic acid developing agents, lactone developing agents or developing agent precursors, such as coumarin developing agents or developing agent precursors, and/or pyrimidine developing agents.

3,666,458
PROCESS FOR TRANSFERRING ELECTROSTATIC CHARGE IMAGES
Reinhold Arneth, Budenheim, Hans Trittler, Wiesbaden-Schierstein, and Jurgen Emig, Mainz-Gonsenheim, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Nov. 24, 1969, Ser. No. 879,463
Claims priority, application Germany, Nov. 25, 1968, P 18 10 757.8
Int. Cl. G03g *13/18*
U.S. Cl. 96—1 3 Claims

This invention relates to a process for the electrophotographic production of copies by transferring an electrostatic charge image from a photoconductor layer on a conductive support onto a dielectric layer on a conductive support, the dielectric layer being in virtual contact with the photoconductor layer, separating the layers from each other, developing the transferred latent charge image by electrophotographic dry or liquid development, and then fixing the same if desired, the photoconductor layer comprising organic charge transfer complexes and being capable, in a thickness of 8 to 15μ, of being charged to 800 to 1,600 volts and the exposed layer having a voltage of at least about 500 volts in the image areas and not more than about 300 volts in the non-image areas.

3,666,459
ELECTROPHOTOGRAPHIC PHOTOCONDUCTIVE COMPOSITION CONTAINING A STYRENE TERPOLYMER BINDER AND A CHARGE-ENHANCING ADDITIVE
Felix P. Liberti, Totowa Borough, and Stanley Field, Piscataway, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.
No Drawing. Filed Oct. 8, 1970, Ser. No. 79,257
Int. Cl. G03g *5/08*
U.S. Cl. 96—1.8 10 Claims

Improved electrophotoconductive coating compositions for application to solid substrates which are to be utilized

in electrophotographic operations are described; said coating compositions employing certain styrene terpolymers and a chlorinated biphenyl charge-enhancing additive.

3,666,460

DIFFUSION TRANSFER ARTICLE AND PROCESS USING HUMECTANT IN EMULSION LAYER

Leonard C. Farney, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Jan. 11, 1966, Ser. No. 526,673
Int. Cl. G03c 5/54
U.S. Cl. 96—29 14 Claims

Photographic products for use in diffusion transfer processes including a light-sensitive silver halide emulsion layer and wherein the emulsion layer further includes a photographically innocuous humectant in an amount sufficient to lower materially the processing time for forming the transfer image.

3,666,461

POLYMERIC MASTER PLATE AND METHOD

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., and Frank X. Weber, Ridgewood, N.J., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 674,773, Oct. 12, 1967. This application Dec. 10, 1969, Ser. No. 883,998
The portion of the term of the patent subsequent to Oct. 19, 1989, has been disclaimed
Int. Cl. G03c 5/00, 1/68
U.S. Cl. 96—35.1 2 Claims

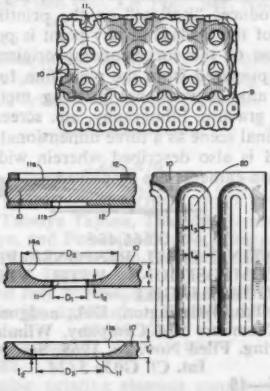
The invention disclosed is for a method of preparing a polymeric master plate having high physical strength and hardness characteristics by using a photocurable composition formed of a particular polyene complex containing at least two -ene or -yne functionality groups per molecule; and a polythiol. The polymeric master plate is prepared by selectively insolubilizing portions of the photocurable composition by exposure to actinic radiation after which uncured portions of the composition are removed from the insolubilized portions to provide ultimately a master plate useful for duplicating printing plates. A new, efficient method for preparing printing plates using the present polymeric master plate is also disclosed.

3,666,462

PROCESS OF SCREENING A SHADOW MASK COLOR TUBE

Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 28, 1969, Ser. No. 811,318
Int. Cl. G03c 5/00; H01j 9/14, 9/22
U.S. Cl. 96—36.1 3 Claims



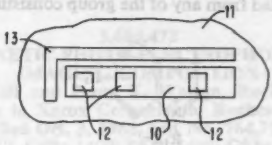
The shadow mask of a shadow mask type of color picture tube is a sheet of steel of a particular thickness that is selectively etched to define a rectangular field of apertures. Each aperture has a diameter exceeding the thickness of the blank and is surrounded by an elemental area that is partially etched to constitute a recessed or reduced-thickness portion of the blank, concentric with the aperture. The tube is screened with phosphors deposited by means of a photographic process, involving the exposure of a layer of photosensitive material by actinic energy directed to the screen through the field of apertures. Thereafter, the mask is re-etched, removing a portion of the recessed elemental area to enlarge the mask apertures to a desired size relative to that of the phosphor deposits.

3,666,463

MASK OVERLAY COMPARISON

David S. Beynnon, Burlington, and Bruce D. King, South Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 6, 1970, Ser. No. 52,227
Int. Cl. G03c 5/04, 5/06
U.S. Cl. 96—41 12 Claims



Patterns in a plurality of masks each having opaque and transparent regions are compared without altering the pattern of opaque and transparent regions in the masks. A photosensitive medium capable of indicating a different exposure condition for each mask is used for this purpose. The masks are superimposed sequentially over the photosensitive medium, and a different exposure condition is used to expose the photosensitive medium through each mask. A different amount of energy of exposure may be used for each mask or a different color of light may be used with each mask if a color sensitive photosensitive medium is employed.

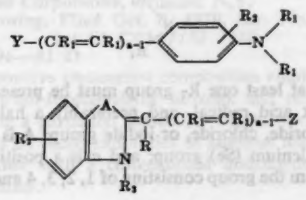
3,666,464

DYE-SENSITIZED PHOTOSENSITIVE MATERIALS HAVING IMPROVED PHOTOGRAPHIC SPEED

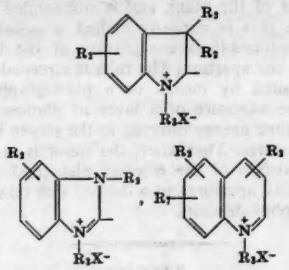
Juergen H. H. Keller and Robert Hicks Sprague, Chelmsford, Mass., assignors to Itek Corporation, Lexington, Mass.

No Drawing. Filed Apr. 26, 1967, Ser. No. 633,689
Int. Cl. G03g 5/00; G03c 5/24, 1/00
U.S. Cl. 96—48 24 Claims

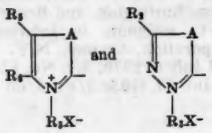
Reproduction systems having improved photographic exposure speed are achieved wherein certain classes of cyanine and hemicyanine dyes are added to photosensitive photoconductor materials comprising titanium dioxide which, when activated, are capable of producing chemical reaction when in contact with image-forming material to produce a visible image. These classes of cyanine and hemicyanine dyes are described by the following generic structural formulas:



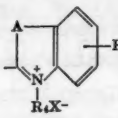
and wherein Y is selected from any of the group consisting of:



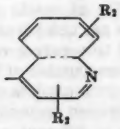
and



and Z is selected from any of the group consisting of:



and



R may be an —H or a —C═N group; R_1 may be hydrogen, alkyl, aralkyl, aryl, and alkaryl groups and wherein any R_1 on a given molecule may be the same or different as any other R_1 on this molecule; R_2 may be hydrogen, alkyl, aralkyl, aryl, alkaryl, alkoxy, and

wherein R_1 is as above described and wherein any R_2 on a given molecule may be the same or different as any other R_2 on this molecule; R_3 and R_4 may be hydrogen, an alkyl, aralkyl, or an alkanol group and may be the same or different, or R_3 and R_4 may form part of the same alkylene, aralkylene, alkalkylene, or hydroxy substituted alkylene group; R_5 and R_6 may be hydrogen, alkyl, aralkyl, aryl or alkaryl groups and wherein R_5 or R_6 may be the same or different than any other R_5 or R_6 group on the same molecule and wherein R_5 or R_6 may form part of the same ring structure when on adjacent carbon atoms and as such same ring structure may form cycloalkylene or aryl groups, or substituted cycloalkylene or aryl groups; R_7 is an —OR_1 or

group and at least one R_7 group must be present; X is a monovalent acid radical, and preferably a halide group such as fluoride, chloride, or iodide group; A is a sulphur (S) or a selenium (Se) group; and *a* is a positive integer selected from the group consisting of 1, 2, 3, 4 and 5.

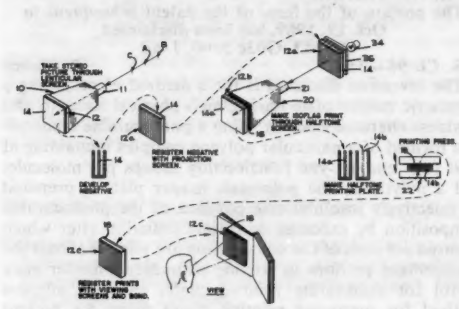
Improved processes using this improved photographic material comprise selectively exposing the above-described reproduction system to activating radiation. Image-forming material can be present on the substrate at the time of exposure to give a direct readout or only part of the image-forming material such as an oxidizing agent such as silver nitrate may be present on the substrate at the time of exposure, with the additional component of the image-forming material being added after exposure such as by contacting with a reducing agent such as Metol. On the other hand, it is possible to apply all of the image-forming material at a time subsequent to exposure to form a visible image. Titanium dioxide having a particle size less than about 250 millimicrons and which has been heated at a temperature between about 200° C. to about 950° C. is the preferred photosensitive material.

3,666,465

HALF TONE REPRODUCTION OF STEREOSCOPIC PHOTOGRAPHS

Douglas F. Winnek, Palo Alto, Calif.
(10450 W. Loyola Drive, Los Altos Hills, Calif. 94022)

Filed Oct. 19, 1967, Ser. No. 676,484
Int. Cl. G03f 5/00; G03c 9/00
U.S. Cl. 96—45 **8 Claims**



A printing plate film for printing stereoscopic pictures to be viewed through a vertical lenticular screen is produced by taking a stereoscopic camera negative through a small aperture lens with a screen in front of the film. The scene is scanned across the interpupilary angle with a mechanical scanning camera. A projection lenticular screen is placed in front of the camera negative and the latter is printed through a grid type halftone screen in front of a printing lenticular screen and the sensitive plate film. A mechanical scanning printer having a small aperture lens produces "isoflags" on the printing plate film. The height of the isoflags at any point is proportional to the brightness of the corresponding original image; and the plate is prepared from the plate film for printing the isoflags by any conventional printing method, such as letter press, gravure, lithography, etc. screen to re-establish the original scene as a three dimensional picture.

A method is also described wherein wide lens taking and projection cameras are employed.

3,666,466

DEACTIVATING DUAL RESPONSE PHOTOSENSITIVE COMPOSITIONS WITH VISIBLE AND ULTRAVIOLET LIGHT

Peter S. Strilko, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 26, 1969, Ser. No. 880,388
Int. Cl. G03c 5/24
U.S. Cl. 96—48 **3 Claims**

Method for deactivating a photosensitive composition, which composition is characterized by forming color on

irradiation with ultraviolet light and being deactivated against color formation on irradiation with light of longer wavelengths, e.g., visible light radiation. The method comprises exposing the surface of the photosensitive composition to be deactivated to both ultraviolet and visible light radiation, with the intensity of the ultraviolet radiation being an amount up to the maximum amount said surface of the composition can absorb without undergoing substantial color formation, the intensity of the visible light radiation being effective for deactivation, whereby the resistance of the composition to color formation on subsequent exposure to ultraviolet light is either increased or the time required to achieve a particular degree of such resistance is decreased.

3,666,467

PHOTOGRAPHIC ELEMENT

Kenneth Reynolds and Thomas David Grinter Hellings, Pinnacles, Harlow, Essex, England, assignors to Minnesota Mining and Manufacturing Company

No Drawing. Filed July 23, 1969, Ser. No. 844,182
Int. Cl. G03c *1/52, 1/64*
U.S. Cl. 96—49 11 Claims

A photographic element having a photosensitive layer comprising, in reactive association, at least one photolytic diazonium salt and at least one palladium compound which is reducible to palladium metal by a photolysis product of said salt, the palladium metal being catalytic to the electrolytic deposition thereon of a base metal.

3,666,468

PROCESS OF COLOR PHOTOGRAPHIC PRINTING PAPER

Hiroyuki Amano and Kazuo Shirasu, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-machi, Kanagawa, Japan

No Drawing. Filed Mar. 19, 1970, Ser. No. 21,184
Claims priority, application Japan, Mar. 19, 1969, 44/21,054
Int. Cl. G03c *5/38, 7/00, 7/16*
U.S. Cl. 96—56 12 Claims

A stabilization composition for use in processing photographic printing papers, comprising a water-soluble aluminum salt, a polycarboxylic acid or a salt thereof, and benzoic acid or a salt thereof, is disclosed.

3,666,469

PHOTOGRAPHIC PROCESSES AND PRODUCTS USING 4,8-DIAMINO SUBSTITUTED 1,5-NAPHTHOQUINONE DYE DEVELOPERS

Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Oct. 27, 1967, Ser. No. 678,547
Int. Cl. G03c *5/30*
U.S. Cl. 96—66 11 Claims

Novel naphthoquinone dye developers (naphthoquinone dyes which are also silver halide developing agents) and to photographic systems employing the same.

3,666,470

PHOTOGRAPHIC PRINTING ELEMENT CONTAINING FLUORESCENT DYE

Nobuo Tsuji, Tatsuya Tajima, Takushi Miyazako, Yoshinori Tsuchiya, and Fumihiko Nishio, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kami-gun, Kanagawa, Japan

Filed July 3, 1969, Ser. No. 838,812
Claims priority, application Japan, July 4, 1968, 43/46,708
Int. Cl. G03c *1/92*
U.S. Cl. 96—82 9 Claims

A photographic printing element containing a water-soluble fluorescent whitening dye and a water-soluble polymer of an N-vinylamide compound.

3,666,471

SILVER HALIDE PHOTOGRAPHIC SENSITIZED PAPER PRODUCING BLACK OR BLUE BLACK IMAGE

Yasushi Ohyama, Takatsuki-shi, and Kiyoshi Futaki, Senji Tosa, Yoshikazu Horiuchi, and Akira Takemura, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

No Drawing. Filed Oct. 29, 1969, Ser. No. 872,376
Claims priority, application Japan, Nov. 1, 1968, 43/79,276
Int. Cl. G03c *1/86, 5/46, 7/00*
U.S. Cl. 96—85 9 Claims

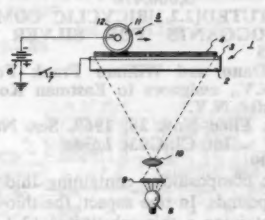
A silver halide photographic sensitized paper producing black or blue black image tone after development and which is endurable against hot-glazing, can be obtained by adding a selected combination of the two sorts of blue-black toners (designated as compounds A and B) in the emulsion layer or in layers adjacent thereto. Compounds A comprise some derivatives of N-alkyl-benzoxazoline-2-thiones, N-alkyl-benzothiazoline-2-thiones, N,N'-dialkyl-benzimidazoline-2-thiones and N-alkyl-1,2-dihydro-quinoline-2-thiones, and compounds B comprise 3-alkyl, aryl or aralkyl derivatives of 4-acylamido - 1,2,4 - triazoline-5-thiones.

3,666,472

MAGNETIC PHOTO-ELECTROPHORETIC IMAGING COMPOSITION

Henry R. Till and Percy K. Watson, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Oct. 3, 1968, Ser. No. 764,716
Int. Cl. G03c *1/00;* B01k *5/00;* G03g *5/00*
U.S. Cl. 96—88 3 Claims



The subject matter of this application pertains to an electrophoretic imaging system wherein the color quality and image contrast are improved by imparting motion to the imaging suspension before or during the imaging cycle.

Motion may be imparted by applying a magnetic field to an imaging suspension containing magnetic particles. The magnetic composition is also described.

3,666,473

POSITIVE PHOTORESISTS FOR PROJECTION EXPOSURE

Lucas A. Colom, Bloomingberg, and Harold A. Levine, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,610
Int. Cl. G03c *1/52, 1/60*
U.S. Cl. 96—91 D 7 Claims

A fast positive photoresist composition employs a mixture of phenol-formaldehyde novolak and resole resins, each having a particular molecular weight distribution as determined by their solubilities in aqueous alkaline solution, together with a conventional diazoketone type of photosensitizer.

3,666,474

SOLVENT SOLUBLE DIAZONIUM METAL SALTS AND DIAZOTYPE MATERIAL THEREFOR

Ralph G. D. Moore, Chenango Forks, N.Y., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed Sept. 11, 1968, Ser. No. 759,195
Int. Cl. G03c 1/54, 113/04
U.S. Cl. 96—91 9 Claims

Light sensitive diazonium hexafluoroarsenate and hexafluoroantimonate salts which are employed in the preparation of diazo formulations for the sensitization of base materials.

3,666,475

PHOTOGRAPHIC MATERIALS

David Ramsay Douglas, Ilford, England, assignor to Ilford Limited, Ilford, Essex, England

No Drawing. Continuation-in-part of application Ser. No. 575,518, Aug. 29, 1966. This application Apr. 28, 1970, Ser. No. 32,781
Claims priority, application Great Britain, Sept. 1, 1965, 37,360/65
Int. Cl. G03c 1/34, 1/04
U.S. Cl. 96—109 2 Claims

A photographic gelatino silver chlorobromide emulsion containing from 0.2 to 3 grams, per gram mole of silver in the emulsion, of a polyethylene oxide which has terminal end groups selected from the class consisting of hydrogen and halogen atoms, carboxyl, amino and carbamoyl groups, higher fatty alcohol residues, saturated higher fatty acid residues and alkyl phenol residues, and from 0.5 to 15 grams of wtaer-soluble hydrolysed polyvinyl acetate having a molecular weight from 5000 to 30,000 and whose residual acetate content is at least 35%.

3,666,476

THIO-SUBSTITUTED[2.2.1]BICYCLIC COMPOUNDS AS ANTIFOGGANTS FOR SILVER HALIDE EMULSIONS

John Robert Dann and William Frank Fowler, Jr., Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,895
Int. Cl. G03c 1/34
U.S. Cl. 96—109 35 Claims

Photographic compositions containing thio-substituted polycyclic compounds. In one aspect, the thio-substituted compounds containing a thio-substituted [2.2.1] bicyclic moiety are good antifoggants in photographic silver halide compositions.

3,666,477

ELEMENT, COMPOSITION AND PROCESS

Charles A. Goffe, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 3, 1970, Ser. No. 43,174
Int. Cl. G03c 1/02
U.S. Cl. 96—114.1 22 Claims

An alkylene oxide polymer, such as polyethylene glycol oleyl ether, and/or a mercaptotetrazole derivative, such as 1-phenyl-5-mercaptotetrazole, in combination with a gelatino silver halide emulsion, a heavy metal salt oxidizing agent and a reducing agent, such as a bis-naphthol reducing agent, in a photosensitive and thermosensitive element suitable for dry processing with heat, provides increased photosensitivity. A combination of a bis-β-naphthol reducing agent, a gelatino silver halide emulsion, an alkylene oxide polymer and/or a mercaptotetrazole derivative in conjunction with a stable source of silver for physical development is useful in photosensitive elements for dry processing with heat. The element can contain a sensitizing dye and an activator-toning agent. A stable developed image is provided by heating the element. Other suitable photosensitive metal salts can be used in the photosensitive element.

3,666,478

PHOTOGRAPHIC MATERIAL CONTAINING ALIPHATIC PERFLUORO COMPOUNDS

Margit Groh, Bourguillon, and Alfred Oetiker, Fribourg, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,166
Claims priority, application Switzerland, Sept. 24, 1968, 14,256/68
Int. Cl. G03c 1/38
U.S. Cl. 96—114.5 3 Claims

Photographic material, preferably for the silver dyestuff bleaching method, is provided which contains in at least one gelatine-containing layer as a wetting agent a water-soluble, surface-active perfluoro compound. With these wetting agents a very good uniformity of the applied gelatine layers is achieved.

3,666,479

PRINT CONTAINING DIFFERENT NUMBERS OF DOTS IN LIGHT AND DARK TONAL AREAS

Raymond H. Wiese, 4536 Holly Ave., St. Louis, Mo. 63115

Filed Jan. 3, 1967, Ser. No. 606,926
Int. Cl. G03f 5/06, 5/00
U.S. Cl. 96—116 7 Claims

A method for producing a halftone screen which contains a different number of dots in different tonal areas and a contact print made from the use of this screen.

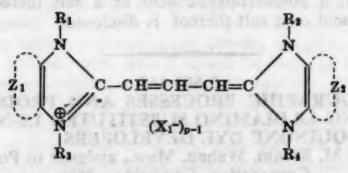
3,666,480

SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

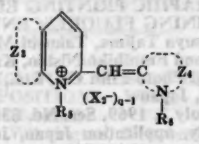
Keisuke Shiba, Akira Sato, and Tadashi Ideka, Ashigara-machi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-machi, Kanagawa, Japan

No Drawing. Filed Oct. 29, 1970, Ser. No. 85,229
Claims priority, application Japan, Oct. 29, 1969, 44/86,580
Int. Cl. G03c 1/14
U.S. Cl. 96—124 9 Claims

A spectrally sensitized silver halide photographic emulsion containing at least one sensitizing dye represented by the following first Formula:



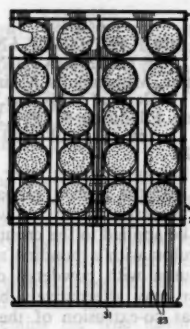
wherein R_1, R_2, R_3 and R_4 each represent alkyl groups, at least one of said R_3 and R_4 being an alkyl group having a sulfo group; Z_1 and Z_2 represent the non-metallic atomic groups necessary to complete a benzimidazole nucleus; X_1^- represents an acid anion and p represents an integer of 1 or 2, p being 1 when said dye forms an intermolecular salt; and at least one sensitizing dye represented by the following second Formula:



wherein Z_3 represents the atomic group necessary to complete a quinoline nucleus; Z_4 represents the non-metallic atomic group necessary to complete a benzothiazole or benzoselenazole nucleus substituted by a carboxylic acid, an alkoxycarbonyl, a carbamoyl, or an

acyl group; R_5 and R_6 represent alkyl groups, at least one of said R_5 and R_6 being an alkyl group having a sulfo group; V_2^- represents an acid anion and q has the same meaning as p.

3,666,481
METHOD OF PROCESSING FOODS
Charles Jere Albright, 313 W. North Ave., Chicago, Ill. 60610
Original application Jan. 25, 1968, Ser. No. 700,608. Divided and this application Feb. 12, 1969, Ser. No. 798,864
Int. Cl. A47j 37/06
U.S. Cl. 99—1 8 Claims



The essential concept of this invention involves one or more facilities each comprising a pair of superimposed, relatively-shiftable elements so structured as to have positioned thereon an ordered arrangement of portioned food-products subject to their being transferred, in the same ordered arrangement, onto an under-positioned support as a result of the relative shifting of the respective pair of elements; the facilites being adapted for use individually or collectively to position an ordered-arrangement of food-serving components on the under-positioned support and subsequently having the same ordered-arrangement of portioned cooked food-products superimposed on the previously-arranged food-serving components on the under-positioned support.

3,666,482
GELLED ALCOHOL-CONTAINING COMESTIBLE
Sol B. Wiczer, 3235 Sleepy Hollow Road, Falls Church, Va. 22042
No Drawing. Substituted for abandoned application Ser. No. 233,190, Oct. 22, 1962. This application Jan. 15, 1968, Ser. No. 697,623
Int. Cl. C12g 3/00
U.S. Cl. 99—30 3 Claims

Comestible product comprising a gelated beverage of highly alcoholic content and having a protective casing about the gel.

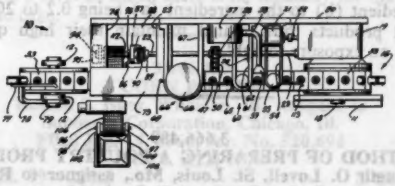
3,666,483
METHOD OF PRODUCING UNIT PORTIONS OF INSTANT COFFEE OR INSTANT TEA
Sven-Erik Tessmar, 8 Lannasbacken 124 43 Bandhagen, Sweden
No Drawing. Filed Mar. 12, 1970, Ser. No. 19,118
Int. Cl. A23f 1/08, 3/00
U.S. Cl. 99—65 4 Claims

A method of producing unit portions of instant coffee or tea which comprises the steps of mixing dry coffee or tea concentrate with a binder substance and forming the resulting coherent composition into unit portions. The binder substance comprises either a mixture of a fat which is solid or semi-solid at room temperature and an emulsifier or a mixture of a fatty acid which is solid or semi-solid at room temperature and a substance capable of forming a water-soluble salt with the fatty acid. The proportions of the dry coffee or tea concentrate to the fat or fatty acid should lie in the range from 2:1 to 1:3.

3,666,484
PROCESS FOR MAKING A SPRAY-DRIED INSTANT TEA OF DESIRED BULK DENSITY
Martin Gurkin, Bardonia, N.Y., and Gary Warner Sanderson and Harold Nathaniel Graham, Englewood, N.J., assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.
No Drawing. Filed Nov. 12, 1969, Ser. No. 876,043
Int. Cl. A23f 3/00
U.S. Cl. 99—77 3 Claims

A process for making a spray-dried instant tea powder without adding foreign filler materials to the instant tea in which the tea extract is prepared from tea leaves by hot water extraction methods, controlled amounts of pectic substances derived from tea leaf are added to the extract and the mixture is spray-dried to form an instant tea powder having the desired bulk density.

3,666,485
APPARATUS FOR MAKING FOOD ITEM
Richard L. Nelson, 669 Riverside Drive, and Walter P. Nelson, 154 Fuller Road, both of Battle Creek, Mich. 49015
Continuation of application Ser. No. 793,220, Jan. 10, 1969, now Patent No. 3,538,840, which is a continuation of application Ser. No. 650,137, June 29, 1967, which in turn is a continuation of application Ser. No. 356,874, Apr. 2, 1964. This application Sept. 21, 1970, Ser. No. 73,807
Int. Cl. A23g 3/00
U.S. Cl. 99—88 5 Claims



A filled edible product is described, as for example a breadstick which is at least initially brittle, substantially unyielding and incompressible. The product is filled by first inserting in a holding means which contains a resilient product support member for resiliently gripping and supporting the stick, after which an elongated cavity is formed in the product and the cavity subsequently filled with an extrudable material such as cheese, whipped cream, custard, fruit preserves and jelly. The invention also includes an apparatus for drilling while properly supporting the product and subsequently filling the cavity formed with the extrudable material.

3,666,486
METHOD FOR INCORPORATING BREAD IMPROVERS IN CONTINUOUS BREADMAKING
William W. Hodgson, West Chester, Pa., and David J. Ash, Independence, Mo., assignors to International Telephone & Telegraph Corp., New York, N.Y.
No Drawing. Filed July 25, 1969, Ser. No. 845,059
Int. Cl. A21d 2/04, 2/16
U.S. Cl. 99—91 7 Claims

Yeast leavened baked products are prepared by continuous processes. In these continuous processes, coated

bread improvers are incorporated into the initial yeast brew step of the processes. The bread improver component remains intact within a solid, insulating water insoluble coating until it is thermally released in the final high speed mixing step to act in promoting the development of the final dough. The coating material is an edible, water insoluble triglyceride fat having a melting point of at least 90° F.

3,666,487

METHOD FOR TREATING PECTIN CONTAINING FRUIT JUICES USING PECTIN TRANSELIMINASE

Tamotsu Yokotsuka, Nagareyama-shi, and Shigetaka Ishii, Noda-shi, Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

No Drawing. Filed Mar. 23, 1970, Ser. No. 22,004
Claims priority, application Japan, Dec. 8, 1969, 44/97,835
Int. Cl. A23l *1/02, 1/04*
U.S. Cl. 99—106 **6 Claims**

Pectin transeliminase is added to a mashed product of fruits or a juice pressed from a fruit, or a filtrate thereof.

3,666,488

METHOD FOR STABILIZING MEAT COLOR AND COMPOSITION THEREFOR

Yukihiro Nakao and Seishi Takagi, Osaka, and Hiromi Nakatani, Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed Feb. 25, 1970, Ser. No. 14,191
Claims priority, application Japan, Feb. 25, 1969, 44/14,134
Int. Cl. A22c *18/00;* A23b *1/00*
U.S. Cl. 99—107 **4 Claims**

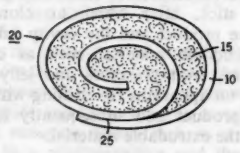
The meat color developed by the conventional curing treatment of meat material with nitrates and/or nitrites is stabilized by the incorporation of (a) ascorbic acid and/or erythorbic acid and (b) isocitric acid into the meat material at a pH of 5 to 7, the weight ratio of the ingredient (b) to the ingredient (a) being 0.2 to 20. The meat products thus treated maintain their high quality even on exposure to light.

3,666,489

METHOD OF PREPARING A POULTRY PRODUCT

Kenneth O. Lovell, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed June 26, 1969, Ser. No. 836,806
Int. Cl. A22c *21/00*
U.S. Cl. 99—107 **2 Claims**



A poultry product is formed by slicing the breast portion into relatively thin slices which are preshaped and cut into a desired configuration. A stuffing material is placed on the poultry slice and thereafter the slice is rolled to confine the stuffing material within the slice. The free end of the poultry slice may then be secured to the roll by use of a binder or the roll may be frozen so as to retain the stuffing material within said roll.

3,666,490

PROCESS OF MAKING AN EDIBLE POULTRY COMPOSITION

Barron S. Whittingham, 3705 S. Robertson Blvd., Culver City, Calif. 90230

No Drawing. Continuation-in-part of application Ser. No. 752,747, Aug. 15, 1968. This application Mar. 5, 1971, Ser. No. 121,577
Int. Cl. A22c *21/00*
U.S. Cl. 99—108 **1 Claim**

An improved poultry food product and process is provided, whereby poultry meat is prepared so that it may be stuffed into, or otherwise enclosed, in a casing of a thin prepared intestinal or other membranous tissue type; and so that the end product may be sliced, and then fried, grilled or otherwise cooked, all without disintegration.

3,666,491

INSTANT SOUP PRODUCT AND METHOD OF PREPARATION

Ali R. Touba, Minneapolis, Minn., assignor to General Mills, Inc.

No Drawing. Filed Feb. 9, 1970, Ser. No. 9,941
Int. Cl. A23l *1/40*
U.S. Cl. 99—124 **14 Claims**

The crouton has an adhering layer of a dry soup base and is suitable for the instant preparation of soup by the addition of the croutons to hot water. The dry soup base layer may be applied to the crouton, for example, by coating the crouton with a bonding agent and then contacting the crouton with powdered dry soup base. The soup base layer may alternatively be applied by other methods such as co-extrusion of the crouton and soup base.

3,666,492

CHEWING GUM

James Teng, St. Louis, Mo., and Chokyun Rha, Worcester County, Mass., assignors to Anheuser-Busch, Inc., St. Louis, Mo.

No Drawing. Filed Apr. 6, 1970, Ser. No. 26,108
Int. Cl. A23g *3/30*
U.S. Cl. 99—135 **4 Claims**

Chewing gum made from a fatty acid ester of starch, preferably starch laurate, as the chewing gum base. The starch laurate has a degree of substitution of above about 2.

3,666,493

PREPARATION OF CHEESE AND PIE FILLINGS

John A. Bluemke, 256 South St., Elmhurst, Ill. 60126

No Drawing. Continuation-in-part of application Ser. No. 857,600, Sept. 12, 1969, which is a continuation of application Ser. No. 601,224, Dec. 12, 1966. This application June 8, 1970, Ser. No. 44,583
Int. Cl. A23c *23/00*
U.S. Cl. 99—139 **4 Claims**

A food composition is prepared by whipping together (a) a homogenized preparation of fat, protein, sugar and emulsifier which has been acidified with an edible acid or lactic acid producing culture and chilled, with (b) a stabilizer of sugar, starch and milk or corn syrup solids.

3,666,494

EARTHY FLAVOR COMPOSITION COMPRISING DIACETYL AND 2,4,5-TRIMETHYL OXAZOLE

Alan P. Bentz, Stamford, Conn., and Joseph F. Mezzino, Pearl River, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed Oct. 16, 1970, Ser. No. 81,519
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R **9 Claims**

An earthy, potato-like or mushroom-like flavor is imparted to foodstuffs by a mixture of 2,4,5 - trimethyloxazole and diacetyl.

3,666,495

NOVEL SULFUR-CONTAINING COMPOUNDS AND COMPOSITIONS AND PROCESSES THEREFOR

William John Evers, Long Branch, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Filed Feb. 5, 1969, Ser. No. 796,923
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R 8 Claims

Novel 3-sulfur derivatives of furan including alkyl furan-3-thiols and bis(alkyl-3-furyl) sulfides and di- and tetrahydro derivatives thereof having meaty and/or roasted aromas and flavors; processes for producing such 3-sulfur derivatives; novel flavoring compositions containing such derivatives; and novel food compositions containing such derivatives.

3,666,496

WATER SOLUBLE, POWDERED, TERPENE-CONTAINING FLAVORS

Raymond Honey, Mount Kisco, N.Y., and James Frank Perkins, Ramsey, N.J., assignors to Firmenich Incorporated, New York, N.Y.

No Drawing. Filed Sept. 3, 1969, Ser. No. 855,049
Int. Cl. A23l *1/26*
U.S. Cl. 99—140 R 14 Claims

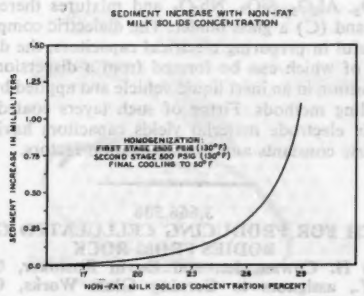
Terpene-containing flavor substances such as oils, essences, extracts, juices or concentrates, are dispersed in aqueous vehicles containing a dissolved normally solid carrier and a poly(oxyethylene)-poly(oxypropylene)-poly-(oxyethylene) block copolymer. Water is eliminated from the formulation to produce a powder in which the flavor ingredients are fixed in and upon the solid carrier. The resulting product retains the true flavor notes of the original flavor, is not subject to deterioration during storage, may be readily dissolved in water to form solutions of brilliant clarity and provides enhanced flavor qualities when incorporated in foods and beverages.

3,666,497

PREPARATION OF HIGH VISCOSITY STERILIZED PROTEIN SOLUTIONS

Aubrey P. Stewart, Jr., Clarence R. Dreier, and John D. Falk, Corning, Iowa, assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 9, 1969, Ser. No. 856,411
Int. Cl. A23c *3/02*
U.S. Cl. 99—212 6 Claims



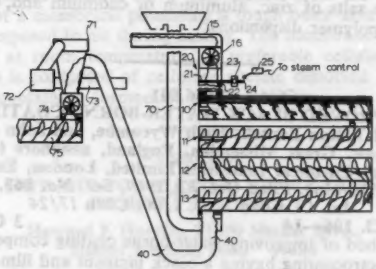
Viscous dairy products having non-fat milk solid concentrations as high as 31% by weight a.. prepared without the occurrence of protein coagulation causing sedimentation by adding a thickening agent to the dairy product in the later stages of sterilization and preferably adding the thickening agent after the product is sterilized.

3,666,498

TERMINAL HEATING PROCESS FOR FREEING FEED INGREDIENTS OF SALMONELLA

Monroe E. Evans, Fayetteville, N.C., assignor to Cape Fear Feed Products, Inc., Fayetteville, N.C.

Continuation-in-part of application Ser. No. 572,115, Aug. 12, 1966. This application Sept. 15, 1969, Ser. No. 857,837
Int. Cl. A23k *3/00;* A23l *3/18*
U.S. Cl. 99—216 6 Claims



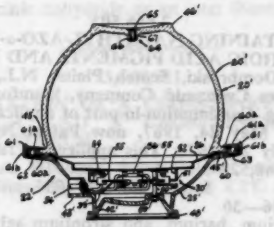
A continuous, large volume terminal heating process for freeing ground, high fat and high bulk density, organic feed meal particles of salmonella without affecting moisture and nutritional content or the particle form includes steps of flash heating while tumbling the particles in dry steam to elevate their temperature, movement of the particles while maintaining them at the elevated temperature, and while continuing movement bringing the temperature down to a level at which there is no tendency for the particles to cake.

3,666,499

CORN POPPER

Russell S. Isnor, Wheaton, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Jan. 14, 1966, Ser. No. 520,694
Int. Cl. A23l *1/18*
U.S. Cl. 99—238.1 3 Claims



A corn popping appliance having a vessel portion and a cover which cooperate to form an enclosure in which corn may be popped. When the cover is inverted, it forms a receptacle of sufficient volume to use as a serving dish for the popped corn. Cooperating means on the cover and vessel portion retain them in assembled condition so that they may be inverted from the cooking to the serving position.

3,666,500

METHOD OF IMPROVING WAX-CONTAINING SELF-POLISHING EMULSIONS AND PRODUCT

Joachim Lange, Gersthofen, Otto Malitschek, Augsburg, and Fred Mader, Nordendorf, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Continuation of abandoned application Ser. No. 746,319, July 22, 1968. This application Mar. 15, 1971, Ser. No. 124,439

Claims priority, application Germany, Aug. 5, 1967, F 53,151

Int. Cl. C08h *9/06;* C09f; C09g *1/10*

U.S. Cl. 106—6 2 Claims

The present invention provides non ionic aqueous self-polishing emulsions for the care of floors containing waxes carrying carboxyl groups, non ionic emulsifiers and 0.25 to 3 equivalents, calculated on the carboxyl groups, of soluble salts of zinc, aluminum or cadmium and, if desired, polymer dispersions.

3,666,501

IMPROVED BLACK WATER-BORNE COATING

Gerald Wilton Barnett, High Wycombe, and John Leslie Inshaw, Great Missenden, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Oct. 22, 1969, Ser. No. 868,605

Int. Cl. C09d *5/08, 1/00;* C08h *17/24*

U.S. Cl. 106—14 3 Claims

Method of improving water-borne coating composition for electrocoating having a black pigment and film-forming resin dispersed in water wherein the improvement consists essentially of a black pigment mixture of either a red or brown simple iron oxide pigment in combination with either a green or blue copper phthalo cyanine pigment.

3,666,502

LITHOGRAPHIC INKS AND SOLUTIONS FOR TREATING LITHOGRAPHIC PLATES

Gustaf L. Erikson, Shaker Heights, Ohio

No Drawing. Continuation-in-part of application Ser. No. 752,443, July 19, 1968, which is a continuation of application Ser. No. 456,557, May 17, 1965. This application Apr. 27, 1970, Ser. No. 32,380

Int. Cl. C09d *11/00, 11/06, 11/12*

U.S. Cl. 106—22 6 Claims

Triacetin and hexylene glycol additives eliminate problems of scumming and greasing with lithographic inks in connection with all types of lithographic plates. These additives improve differential inkability thus giving sharper images and high resolution without sacrificing fullness of print.

3,666,503

INKS CONTAINING NAPHTHYL-AZO-α-HYDROXY-NAPHTHOIC ACID PIGMENTS AND METHOD

Frank P. Dombroski, Scotch Plains, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 640,820, May 24, 1967, now Patent No. 3,520,870, dated July 21, 1970. This application June 22, 1970, Ser. No. 48,520

Int. Cl. C09d *11/08*

U.S. Cl. 106—30 4 Claims

The calcium, barium, and strontium salts of the azo compound obtained by coupling 2-naphthylamine-1-methylsulfonic acid with beta-hydroxynaphthoic acid are pigments of a desirable and unusual shade of maroon with excellent properties as to strength, gloss, transparency, etc., and form ink formulations which have superior storage stability.

The pigments are thought to be properly named as the calcium, barium or strontium salts of 2-(3'-carboxy-2'-hydroxy - 1' - naphthyl)azo-naphthyl-1-methylsulfonic acid, or mixtures thereof.

Wood rosin and/or other conditioning treatments are preferred.

3,666,504

PROCESS FOR PREPARING MOULDING SAND

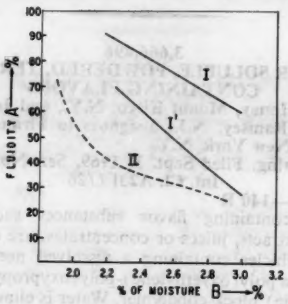
Hendrik van den Berg, 36 Isaac da Costalaan, Delft, Netherlands, and Herman G. Levelink, 34 Julianalaan, Pijnacker, Netherlands

Continuation-in-part of abandoned application Ser. No. 867,612, Oct. 20, 1969. This application Mar. 29, 1971, Ser. No. 128,689

Claims priority, application Netherlands, Oct. 22, 1968, 6815124

Int. Cl. B28b *7/34*

U.S. Cl. 106—38.35 5 Claims



A process is described for preparing a moulding sand having improved properties over ordinary moulding sand as for fluidity, moisture content, cohesion and scabbing resistance by adding to ordinary moulding sand a maximum of 2% by weight of pulverized cocoa beans or parts of them such as ground cocoa shells or cocoa expellers.

3,666,505

HIGH DIELECTRIC CONSTANT CERAMIC BODIES AND COMPOSITIONS FOR PRODUCING SAME COMPRISING IRON OXIDE

Lewis C. Hoffman and Takashi Nakayama, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 733,288, May 3, 1968. This application Nov. 20, 1970, Ser. No. 91,538

Int. Cl. C04b *33/06;* H01b *1/06*

U.S. Cl. 106—39 R 14 Claims

Dielectric compositions comprising powder mixtures of (A) a calcined inorganic material consisting essentially of $BaTiO_3$ and an oxide selected from the group consisting of ZrO_2, Al_2O_3, SiO_2, Nb_2O_5 and mixtures thereof, (B) Fe_2O_3 and (C) a glass binder. The dielectric compositions are useful in preparing electrical capacitors, the dielectric layers of which can be formed from a dispersion of the composition in an inert liquid vehicle and applied by screen stencilling methods. Firing of such layers coated with a suitable electrode material yields capacitors having high dielectric constants and low dissipation factors.

3,666,506

BATCH FOR PRODUCING CELLULATED GLASSY BODIES FROM ROCK

James H. Cowan, Jr., and David Rostoker, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 812,365, Apr. 1, 1969. This application Sept. 28, 1970, Ser. No. 76,226

Int. Cl. C04b *33/00*

U.S. Cl. 106—41 8 Claims

This invention relates to cellulated glassy bodies, having a uniform closed cellular structure and a density on the

order of .4 gram/cc., made by preparing a mixture of clay, sodium hydroxide, other fluxes, and an organic cellulating agent, and then firing the mixture, preferably at temperatures less than about 950° C. (1740° F.).

3,666,507

FUSION-CAST CARBIDE CERAMIC COMPRISING FREE-SILICON

Allen M. Alper, Towanda, Pa., and Robert C. Doman, Painted Post, and Neil E. Johnson and Robert N. McNally, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

No Drawing. Filed May 15, 1970, Ser. No. 37,861

Int. Cl. B22f *3/00;* **C04b** *35/14*

U.S. Cl. 106—44 **5 Claims**

Dense, fine-grained, essentially crack-free toughly coherent bodies having a crystalline microstructure consisting essentially of, by weight, 10 to 89% boron carbide phase, 10 to 89% silicon carbide phase and 1 to 30% silicon phase, which latter phase is important to noted essential characteristics. Method of fusion casting employing batch mixture including elemental silicon in an effective amount at least sufficient to yield the silicon phase. Useful in a variety of situations requiring good resistance to degradation at high temperature, chemical corrosion, abrasive wear and/or impact stresses.

ERRATUM

For Class 106—52 see:
Patent No. 3,666,414

3,666,508

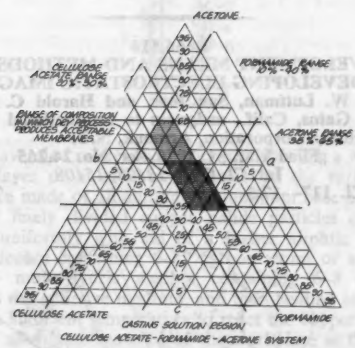
HIGH FLUX SEMIPERMEABLE CELLULOSIC DERIVATIVE MEMBRANES WITH DRY HANDLING CAPABILITIES AND THEIR METHOD OF PREPARATION

Mary Ann Justice, Los Angeles, Calif., and Joseph W. McCutchan, University Park, Md., assignors to The Regents of the University of California

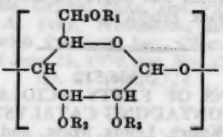
Filed May 22, 1968, Ser. No. 731,094

Int. Cl. B29d *27/04;* **C08b** *27/42, 29/10*

U.S. Cl. 106—183 **12 Claims**



The present invention is directed to dry semipermeable membranes which can advantageously be dry-stored and used for the selective separation of various components of a solution such as salt water. The membranes are prepared by casting a solution of a cellulosic derivatives having units represented by the formula



wherein R_1, R_2 and R_3 are selected from the group consisting of R_4 and CR_5O, wherein hydrogen R_4 is an alkyl containing from 1 to 8 carbon atoms and R_5 is an alkyl containing from 1 to 7 carbon atoms, and wherein no more than two of R_1, R_2, and R_3 can be H, to form a membrane. The membrane is then immersed in an aqueous medium for a time sufficient for the formation of a membrane possessing a tough outer skin on the side exposed to air during casting. The membrane is then dried at room temperature. A preferable cellulosic solution is composed of cellulose acetate dissolved in acetone containing formamide as an additive.

3,666,509

DRY MIX FOR MAKING HEAVY DUTY WHITE CONCRETE

Howard J. Horvitz, 21800 Shaker Blvd., Shaker Heights, Ohio 44122

No Drawing. Filed Sept. 8, 1970, Ser. No. 70,549

Int. Cl. C04b *31/02*

U.S. Cl. 106—98 **19 Claims**

A dry mix for making white concrete which includes approximately 18 to 35% white cement, approximately 63 to 80% aggregate and approximately 0.5 to 5% titanium dioxide, the aggregate having a fineness modulus approximately in the range 3.3 to 4.2.

3,666,510

LUBRICATED THERMOPLASTIC RESIN COMPOSITIONS

Antony W. M. Coaker, St. Louis, and Richard C. Gross, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 13, 1967, Ser. No. 690,088

Int. Cl. C08f *45/38*

U.S. Cl. 106—181 **17 Claims**

This invention relates to improved thermoplastic resin compositions which contain a long chain alkenyl substituted succinic anhydride or an ester thereof as a lubricant.

3,666,511

COMBINATION OF A CROSS-LINKED WAXY STARCH AND A CROSS-LINKED NON-WAXY STARCH

Leamon Dale Williams, Palos Heights, and Edward R. Jensen, Hinsdale, Ill., assignor to CPC International Inc.

No Drawing. Continuation-in-part of application Ser. No. 816,021, Apr. 14, 1969. This application Mar. 16, 1970, Ser. No. 20,018

Int. Cl. C08b *25/02*

U.S. Cl. 106—210 **7 Claims**

An improved starch material suitable for making puffed, deep fat fried snack products comprising a combination of from about 30% to about 70% of a cross-linked waxy starch with from about 30% to about 70% of a cross-linked non-waxy starch. The non-waxy starch

preferably is milo starch, corn starch, or mixtures thereof. Also, a process for producing a puffed, deep fat fried snack product from this improved starch material and the resulting snack product.

3,666,512
COMPOSITIONS OF FATTY ACID ANHYDRIDES CONTAINING CATALYST

Russell Joseph Kulick, Lenox, Mass., and Edward Strazdins, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 712,601, Mar. 13, 1968, now Patent No. 3,445,330, which is a continuation-in-part of applications Ser. No. 112,781, May 26, 1961, Ser. No. 420,783, Dec. 23, 1964, and Ser. No. 490,636, Sept. 27, 1965. This application Mar. 25, 1970, Ser. No. 22,696

The portion of the term of the patent subsequent to May 20, 1986, has been disclaimed

Int. Cl. C08b *25/02*

U.S. Cl. 106—213 **4 Claims**

The invention provides compositions comprising hydrophobic cellulose-reacting paper-sizing carboxylic acid anhydrides and a catalyst which accelerates the rate at which the anhydride develops its sizing properties when deposited on cellulose from aqueous medium and heated.

3,666,513
TREATMENT OF MINERALS

Peter James Malden, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, Cornwall, England

No Drawing. Filed Mar. 25, 1970, Ser. No. 22,714

Int. Cl. C09c *1/28*

U.S. Cl. 106—288 B **9 Claims**

A process for improving the brightness of phyllosilicate minerals containing ferric ions in solid solution within the crystal lattice of the minerals. The process comprises the steps of bleaching by a reducing bleaching agent an intercalation complex of a phyllosilicate mineral and thereafter decomposing the intercalation complex under non-oxidising conditions.

3,666,514
FIBROUS TRANSITION METAL PHOSPHATES

Paul Clifford Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,425

Int. Cl. C09c *1/00, 1/14, 1/31*

U.S. Cl. 106—288 B **8 Claims**

This invention encompasses fibrous, colloidal, crystalline, water-insoluble phosphates having at least two transition metal ions in their +4 valence state where 20 to 98% of the metal ion content on an atomic basis is a quadrivalent ion of titanium, zirconium, hafnium, molybdenum, tungsten, tin, lead, thorium or uranium and the remaining percentage being +4 valent cerium ions with the ratio of phosphate groups to total metal atoms being from 2:1 to 1.5:1.

3,666,515
PROCESS FOR THE PRODUCTION OF CEMENT EXPANSIVE ADDITIVES

Kozi Nakagawa, Toyama, Japan, assignor to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 15, 1970, Ser. No. 46,363

Claims priority, application Japan, June 13, 1969, 44/46,281; June 14, 1969, 44/46,618

Int. Cl. C04b

U.S. Cl. 106—314 **11 Claims**

A process for producing cement expansive additives in a direct resistance heating electric furnace comprising forming a melt of an inorganic fluoride around the electrodes in the furnace, adding gradually a mixture of an inorganic fluoride and a blend of CaO—$CaSO_4$—Al_2O_3 to the melt, heating the mixture to a temperature of from 1200 to 1400° C.

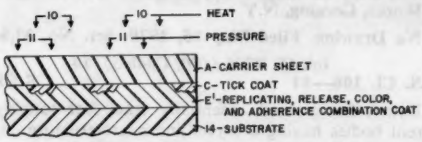
3,666,516
HOT STAMP TAPE

Richard E. Dunning, 650 W. 67th Place, Hammond, Ind. 46375

Filed Oct. 12, 1971, Ser. No. 188,423

Int. Cl. B41m *3/12;* **B44c** *1/16*

U.S. Cl. 117—3.4 **8 Claims**



A web of indeterminate length carrying thermally transferable material, usually referred to as hot stamp tape, is structured to provide an improved simulated wood grain pattern on a substrate after transfer to the substrate of transferable portions of the tape. The web or tape may be provided in sheet form. The structure comprises "ticks" or discrete linearly oriented spots of material having low specular reflectivity coated on a matte carrier sheet, as by printing and a layer coated thereon to provide the top layer of the transferred material, which replicates the surface of the carrier sheet and the coated ticks or dots.

3,666,517
POROUS ARTICLE

Robert B. Isaacson, Rahway, N.J., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Original application Nov. 16, 1966, Ser. No. 594,657, now Patent No. 3,539,374, dated Nov. 10, 1970. Divided and this application Feb. 16, 1970, Ser. No. 11,843

Int. Cl. B29d *27/00;* **B32b** *31/12*

U.S. Cl. 117—7 **7 Claims**

A method is disclosed and claimed for depositing a coating on a plastic film and thereafter subjecting the coated film to draw and annealing steps so as to produce a coated film that is characterized by a microporous, low density structure. The coated films of this invention are useful as rescue blankets, sleeping bags and the like.

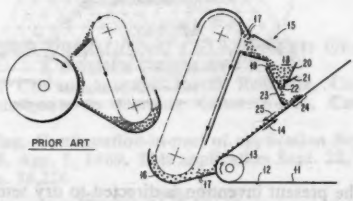
3,666,518
DEVELOPMENT MEANS AND METHODS FOR DEVELOPING ELECTROSTATIC IMAGES

Erwin W. Luttman, San Jose, and Harold C. Medley, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,265

Int. Cl. C03g *13/08, 15/08*

U.S. Cl. 117—17.5 **7 Claims**



This is a method for developing electrostatic images on a moving insulating surface with developer material in which the flow of developer material moves downward

and in a direction opposite to the movement of the insulating surface and which can be termed counterflow cascade development. The flow of developer material is directed onto the insulating surface such that a finishing development zone is formed at the point of entry of the developer material to a point upward therefrom. In addition, means having a controlling force over toner depleted carrier particles is positioned adjacent the finishing development zone for regulating such particles and thereby preventing them from being carried upwardly and out of the zone.

3,666,519

POLYOLEFIN SUBSTRATE DECORATED WITH A HEAT FUSED POLYESTER-ALKYD RESIN PRINTING INK

John W. Bayer, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Application June 25, 1968, Ser. No. 739,610, now Patent No. 3,557,691, dated Jan. 26, 1971, which is a continuation-in-part of application Ser. No. 393,049, Sept. 8, 1964. Divided and this application July 9, 1970, Ser. No. 53,626

Int. Cl. G03g *13/22, 13/08*

U.S. Cl. 117—17.5 4 Claims

There is disclosed an article of manufacture decorated with an electrostatic printing ink composition consisting essentially of a free-flowing, heat fusible polyester-alkyd resin powder prepared by reacting a difunctional, aliphatic, hydroxy compound, e.g. a glycol, and a dicarboxylic acid or anhydride in the presence of a drying oil acid, e.g. a vegetable oil fatty acid.

3,666,520

PROCESS OF FORMING A METALLIC COPPER LAYER ON THE SURFACE OF WORKPIECE OF ALUMINUM OR ALUMINUM BASE ALLOY

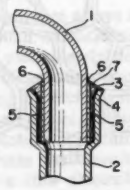
Shiro Terai and Yoshihiko Sugiyama, Nagoya, Toshio Suzuki, Kasugai, and Hiroshi Irie, Nagoya, Japan, assignors to Sumitomo Light Metal Industries Limited, Tokyo, Japan

Filed Aug. 31, 1970, Ser. No. 68,313

Claims priority, application Japan, Sept. 10, 1969, 44/71,861, 44/71,862

Int. Cl. C23c *3/04*

U.S. Cl. 117—22 10 Claims



This invention relates to a process of forming a metallic copper layer of a uniform thickness on the surface of workpiece made of aluminum or aluminum base alloy by applying finely divided copper halide particles on said surface uniformly with aid of a higher aliphtic monohydric alcohol containing 6–12 carbon atoms or a cycloaliphatic mono-hydric alcohol containing 6–8 carbon atoms as the adhesive medium, and then heating said surface to a sufficient temperature to react the copper halide with the aluminum material of the workpiece at the surface of the workpiece, whereby metallic copper is liberated, deposited on and partly diffused into the surface of the workpiece and a firmly adhered copper layer of a uniform thickness may be formed on the surface of the aluminum or aluminum base alloy material and, if desired, within a sharply limited area of the surface of the workpiece.

3,666,521

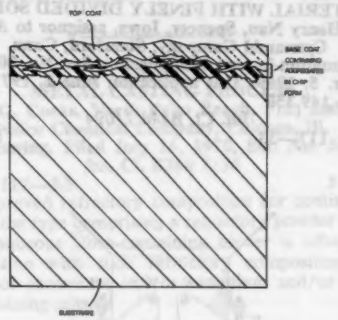
COATED SUBSTRATE AND METHOD OF PROVIDING SAME

Philip L. Weyna, Crystal Lake, and Volney P. Thuma and David A. Frey, Woodstock, Ill., assignors to Morton-Norwich Products, Inc., Chicago, Ill.

Filed June 18, 1970, Ser. No. 47,544

Int. Cl. B44d *1/14*

U.S. Cl. 117—26 8 Claims



A method of applying a durable coating to a substrate such as floors, walls, furniture, metal and the like involving applying to the substrate a base coating of an aqueous copolymer dispersion, adding solid particulate aggregate to the base coat, drying the mixture and then adding a top coat of an aqueous dispersion of a cross-linkable copolymeric composition comprising an aqueous copolymer dispersion prepared from, on an overall basis, about 30 to about 60 weight percent of a combination of at least one monoethylenically unsaturated hardening monomer and at least one monoethylenically unsaturated softening monomer, and from about 1 to about 10 weight percent of a cross-linking agent, said hardening monomer comprising from about 25 to about 60 weight percent of the total monomers and being selected from the group consisting of styrene, acrylonitrile, and alkyl methacrylates, and said softening monomer comprising up to about 75 weight percent of the total monomer composition and being selected from the group consisting of alkyl acrylates containing from 1 to 10 carbon atoms in the alkyl group, and drying to form an attractive, tough and resilient coating.

3,666,522

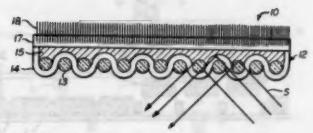
FLAMEPROOF FABRIC CONSTRUCTION

Stephen George, 747 Swinton Ave., Bronx, N.Y. 10465

Filed Mar. 26, 1970, Ser. No. 22,819

Int. Cl. B44c *1/08*

U.S. Cl. 117—33 8 Claims



A fabric construction providing a nap surfaced flameproof fabric subject to being made light impervious and subject to having desired decorative effects applied to the nap surface. The fabric is formed by coating or impregnating a woven fiberglass base fabric with an air impervious coating, such for example as aluminum or the

like metallic material adapted to form a light impervious barrier on the base fabric. The desired nap surface on the fabric is provided by securing flock to one side of the base fabric. The flock is secured by means of an adhesive which in the presence of heat prevents the flow of oxygen to the flock fibers.

3,666,523

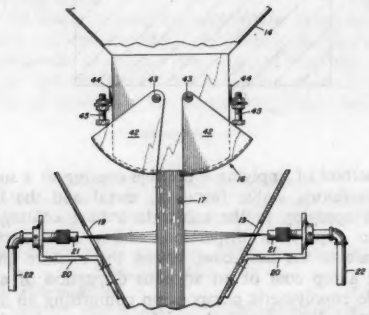
PROCESS FOR COATING PARTICULATE MATERIAL WITH FINELY DIVIDED SOLIDS

Harold Henry Nau, Spencer, Iowa, assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 804,621, Mar. 5, 1969. This application June 2, 1971, Ser. No. 149,350

Int. Cl. B44d *1/094*

U.S. Cl. 117—33 5 Claims



A method is given for uniformly coating particulate fertilizer material with small amounts of finely divided micro and/or secondary nutrients by forming the particulate base fertilizer material in a falling curtain, spraying the base material with a binder solution, finally mixing in an agitated bed the base material with the finely divided nutrients, thus giving a product of micro and/or secondary nutrients uniformly distributed over the surfaces of the particulate base fertilizer.

3,666,524

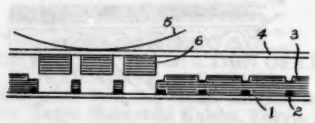
PRESSURE TRANSFER REPRODUCTION

Robert J. Wright, Tranmere, South Australia, Australia, assignor to Research Laboratories of Australia Pty. Limited, Eastwood, South Australia, Australia

Filed Sept. 4, 1970, Ser. No. 69,561

Int. Cl. B41m *5/10*

U.S. Cl. 117—36.4 5 Claims



In pressure transfer printing a printed substrate pattern on a base member confers differences in the bond strength of a subsequent pigmented transfer coating in relation to the base member whereby the edge definition of characters printed by contact pressure with said pigmented coating is defined by the pattern of the printed substrate coating.

3,666,525

HEAT SENSITIVE COPYING SHEET

Shiro Kimura, Teruo Kobayashi, and Sadao Ishige, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara-machi, Kanagawa, Japan

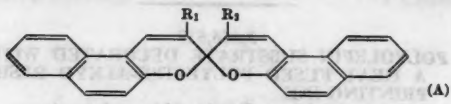
No Drawing. Filed May 26, 1970, Ser. No. 40,732

Claims priority, application Japan, May 26, 1969, 44/40,719

Int. Cl. B41m *5/18*

U.S. Cl. 117—36.8 17 Claims

Heat sensitive copying papers using a spiro compound having the Formula A



(A)

wherein R_1 and R_2 each is selected from the group consisting of a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, a carboxylic acid ester, an aralkyl group and a phenyl group, a solid organic sulfonic acid having the Formula B

$$R—SO_3H \qquad (B)$$

wherein R is selected from the group consisting of an amino group, an N-substituted amino alkyl group having from 2 to 18 carbon atoms, an unsubstituted amino alkyl group having from 2 to 18 carbon atoms, an alkyl group having from 10 to 20 carbon atoms, an alkoxy group having from 10 to 20 carbon atoms, a carboxylic acid substituted alkyl group, said alkyl group having from 6 to 18 carbon atoms, and an aromatic ring, and a thermofusible material having a melting point ranging from 50 to 180° C. are disclosed.

3,666,526

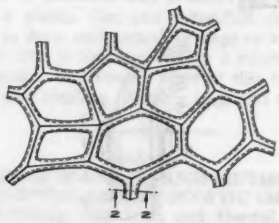
REFRACTORY POROUS BODIES

Bruce L. Ettinger, Detroit, and Samuel M. Wolosin, Oak Park, Mich., assignors to General Electric Company

Filed Jan. 6, 1966, Ser. No. 519,080

Int. Cl. C23c *13/00*

U.S. Cl. 117—46 CB 12 Claims



Porous bodies of interconnected cellular structure having extremely high strength-to-weight ratios at elevated temperaures. The porous bodies have a foam substrate of uniform cell structure, produced by the thermal decomposition of an organic foam, and a refractory coating on the substrate of a vapor-deposited pyrolytic material.

3,666,527

METHOD OF ELECTROLESS DEPOSITION OF METALS WITH IMPROVED SENSITIZER

Nathan Feldstein, Kendall Park, and Thomas Stephen Lancsek, Mercer, N.J., assignors to RCA Corporation

No Drawing. Filed July 31, 1970, Ser. No. 60,091

Int. Cl. B44d *1/092*; C23c *17/02*

U.S. Cl. 117—47 A 8 Claims

Method for autocatalytically electrolessly plating a dielectric surface with a metal such as nickel, cobalt or

copper comprising sensitizing the surface with an improved sensitizing solution comprising both divalent tin ion and tetravalent tin ion, the solution having a pH less than about 1.5, treating the sensitized surface with a catalyzing solution to provide catalytic nucleating centers, and plating the metal on the catalyzed surface. The improved sensitizing solution permits plating on smooth, dense, water repellent plastic surfaces such as Teflon, Lucite, silicone rubbers and Mylar.

3,666,528

METHOD OF APPLYING FILLED POLYIMIDE COMPOSITIONS TO INTERNAL CYLINDRICAL SURFACES

Keith F. Barnhardt, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 16, 1968, Ser. No. 745,294
Int. Cl. B44d *1/34*
U.S. Cl. 117—49 2 Claims

Certain filled polyimide compositions are disclosed in addition to a method of applying the same in coatings of substantial thickness to internal cylindrical surfaces of compressor housings, labyrinth seal bands and the like. In a preferred embodiment a mixture of a solution of polyimide precursors and talc are centrifugally cast onto a metallic cylindrical surface such that most of the solvent is evaporated and the precursors are partially cured so as to be structurally selfsustaining. The rotation of the article to be coated is stopped and the coating is further cured under the pressure of an inert atmosphere such that residual solvent and volatile curing reaction by-products are evolved without blistering the coating.

3,666,529

METHOD OF CONDITIONING ALUMINOUS SURFACES FOR THE RECEPTION OF ELECTROLESS NICKEL PLATING

Ralph R. Wright and George S. Petit, Oak Ridge, and Calvin C. Wright, Lenoir City, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Apr. 2, 1969, Ser. No. 812,901
Int. Cl. B44d *1/092*; C23f *1/00*
U.S. Cl. 117—50 3 Claims

Aluminum and aluminum alloys are subjected to a preplating treatment which conditions the surfaces of these metals for receiving electrolessly deposited nickel plating directly thereon. A clean aluminous surface is prepared for electroless plating by etching in an alkaline solution and then pickling in an acidic solution containing chloride ions. An alkaline solution containing hypophosphite ions is employed to activate the aluminous surface which is then provided with a thin electroless nickel strike coat by immersion in an ammonical solution containing nickel ions, hypophosphite ions, and a chelating agent. After the electroless strike coat is applied, the aluminous surface is provided with a plating of electroless nickel in a conventional, essentially halogen-free bath.

3,666,530

NOVEL SILICIOUS SILICONE BONDED MATERIALS

Walter A. Aue and Corazon R. Hastings, Columbia, Mo., assignors to Research Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 873,090, Oct. 31, 1969. This application Oct. 22, 1970, Ser. No. 83,215
Int. Cl. B32b *17/00*; C03c *17/30*
U.S. Cl. 117—54 20 Claims

There is provided a novel type of silicious material having bonded thereto silicone or polysiloxane polymers. These novel materials are produced by activating all or most of the available hydroxyl groups in a silicious surface and reacting said hydroxyl groups with silanes or siloxanes having labile groups. These silyl or siloxyl moieties are then polymerized to yield a material having a silicone polymer chemically bonded to the surface of the silicious material. These novel products are useful as a combined stationary and liquid phase in gas chromatography. They are especially useful in the chromatography of highly polar materials.

3,666,531

METAL CASTING PROCESS

Thomas G. Cocks, North Palm Beach, Fla., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed July 16, 1970, Ser. No. 55,567
Int. Cl. B28b *7/36*
U.S. Cl. 117—5.3 3 Claims

An improved refractory composition for coating ingot molds of the type comprising a refractory powder slurried into an aqueous silica-containing binder is afforded by incorporation with such refractory composition small amounts of chromium and/or vanadium and/or manganese containing salts.

3,666,532

DIMENSIONALLY STABLE MATTE-SURFACED POLYESTER DRAFTING FILM

Albert J. Reedy and Walter R. White, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 699,323, Jan. 22, 1968. This application July 2, 1970, Ser. No. 52,098
Int. Cl. B32b *27/36*; G03c *1/78*
U.S. Cl. 117—76 F 6 Claims

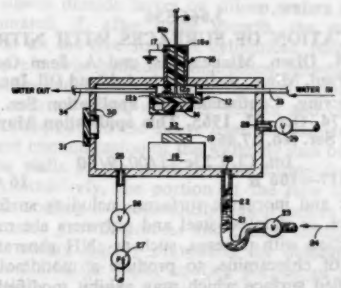
The eraseability of matte-surfaced polyester sheeting useful in engineering drafting is significantly improved by laying down directly on the matte surface either a thin layer of a polymeric tergel or a two layer configuration, the first layer being a terpolymer based on vinylidene chloride, an unsaturated ester, and an unsaturated carboxylic acid, and the second layer being a very thin gelatin layer.

3,666,533

DEPOSITION OF POLYMERIC COATINGS UTILIZING ELECTRICAL EXCITATION

Stuart M. Lee, Orange County, Calif., assignor to North American Rockwell Corporation

Filed Nov. 16, 1970, Ser. No. 89,970
Int. Cl. B44d *1/44*
U.S. Cl. 117—93.1 GD 1 Claim



An electric deposition process providing a glow discharge by virtue of electrical energy fields provided internal to a deposition chamber enables with one step to

provide a protective coating of a surface of a substrate material by polymerizing a dimer solid starting material. A carrier gas such as argon, xenon or krypton is used in the deposition chamber for the energy field to act upon it, provide the glow and cause the glowing gas to volatilize particles of the starting material and be deposited as the protective coating on the substrate.

3,666,534

METHOD OF MANUFACTURING GLASS ARTICLES HAVING A HEAT-REFLECTING FILM

Rolf Groth, Aachen, Germany, and Henricus Johannes Joseph Van Boort and Gerard Marie Jules De Neve, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,137

Int. Cl. B44d *1/48, 1/08*

U.S. Cl. 117—97 **8 Claims**

The invention relates to the manufacture of a glass envelope for a sodium vapour discharge lamp which envelope is provided with a film of doped indium oxide.

To obtain an envelope having both few internal mechanical tensions and a great heat reflectivity, the envelope is heated for 5 to 15 minutes at a given temperature after it has been provided with the indium oxide film, during which heat treatment the indium oxide film is contacted with a gas mixture comprising a very small percentage of oxygen.

3,666,535

METHOD OF MAKING POROUS OBJECTS

Donald D. Woolley, Alhambra, and Elden L. Goodenow, Los Angeles, Calif., assignors to The Gillette Company, Boston, Mass.

Filed Apr. 9, 1970, Ser. No. 26,849

Int. Cl. B05c *8/04;* **D02g** *3/36*

U.S. Cl. 117—98 **8 Claims**

Improvements in continuous methods of manufacturing elongated porous, absorbent and strong objects made of filamentary materials, provided with longitudinally extending channels through which fluid such as ink, may flow by capillary action, the filamentary material being bonded together and the size of the capillaries controlled by repeated applications of a bonding resin. Also relates to porous objects made by the method, said objects when used in writing instruments having greater durability and wear resistance, strength, resistance to feathering and longer life in the production of uniform writing traces.

3,666,536

MODIFICATION OF SURFACES WITH NITRENES

Douglas A. Olsen, Minneapolis, and A. Jean Osteraas, St. Paul, Minn., assignors to Ashland Oil, Inc.

No Drawing. Continuation of application Ser. No. 504,174, Oct. 23, 1965. This application May 18, 1970, Ser. No. 37,469

Int. Cl. C23c *11/00, 9/00*

U.S. Cl. 117—106 R **16 Claims**

Organic and inorganic surfaces, including surfaces of metals such as stainless steel and polymers are modified by interaction with nitrenes, such as :NH generated by pyrolysis of chloramine, to produce a monomolecular-like modified surface which may exhibit modified properties of adhesion, surface tension, a low coefficient of friction, electrical resistance, corrosivity, permeability, durability and lubricity, as compared to an otherwise similar unmodified surface.

3,666,537

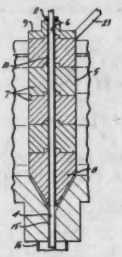
METHOD OF CONTINUOUSLY TEEMING AND SOLIDIFYING VIRGIN FLUID METALS

Sylvester V. Williams, Omaha, Nebr., assignor to Elwin A. Andrews, Milwaukee, Wis.

Continuation-in-part of application Ser. No. 497,177, Oct. 18, 1965. This application May 1, 1969, Ser. No. 820,847

Int. Cl. C23c *1/00*

U.S. Cl. 117—114 R **4 Claims**



Virgin fluid metal is continuously teemed and solidified from the inside outwardly by accretion upon a continuously moving solid body of the same metal.

3,666,538

PROCESS OF RENDERING A SOLID MATERIAL OIL AND WATER REPELLENT

Elemer Domba, Olympia Fields, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 848,103, Aug. 6, 1969. This application Oct. 12, 1970, Ser. No. 80,118

Int. Cl. D06m *15/00*

U.S. Cl. 117—121 **5 Claims**

The process of rendering a solid material oil and water repellent which comprises treating the material with an aqueous solution containing a fluoroamidoalkyl polysiloxane which is formed by the polymerization product of polyfluoro amido silane monomer and a copolymerizing monomer selected from the group consisting of epoxy siloxane monomer and silatranes; and drying to cure the treated material at a temperature of from 20–120° C.

3,666,539

HIGH TEMPERATURE CURING THERMOSETTING DECORATIVE COMPOSITION

Robert H. Kiel, deceased, late of Weston, Ohio, by Jessie H. Kiel, administratrix, Weston, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Continuation of application Ser. No. 688,697, Dec. 7, 1967, which is a continuation-in-part of applications Ser. No. 489,734, Sept. 23, 1965, and Ser. No. 571,986, Aug. 12, 1966. This application Apr. 20, 1970, Ser. No. 28,260

Int. Cl. C03c *17/30*

U.S. Cl. 117—124 F **16 Claims**

This invention relates to the preparation of a novel organic thermosetting resin base decorative composition having increased permanency of adhesion to a glass surface and capable of being cured at elevated temperatures up to about 2000° F. without browning or degrading thereof, said composition consisting essentially of approximately stoichiometric proportions of at least one carboxyl functional acrylic resin and at least one hydroxyl containing epoxy resin, and an ambifunctional, epoxy reactive silane present in an amount sufficient to substantially improve the permanency of adhesion of the composition to a glass surface. A further advantage of this invention is that the composition can be conveniently mixed and stored in one container until used.

3,666,540
NOBLE METAL ALLOYS
Arthur Peter Burnett, Tariffville, Conn., assignor to The J. M. Ney Company, Bloomfield, Conn.
No Drawing. Filed July 26, 1967, Ser. No. 656,048
Int. Cl. C22c 5/00; B32b 15/04
U.S. Cl. 117—129 8 Claims

Novel gold alloys having desirable properties of hardness and solidus temperature are provided which comprise about 67.0 to 87.0 percent gold, about 7.0 to 15.0 percent palladium, about 2.0 to 10.0 percent platinum, about 0.5 to 1.0 percent of iron and about 0.5 to 2.0 percent tin, all based upon the total weight of the alloy. Optional alloying elements include up to about 2.0 percent silver, 1.5 percent zinc, 1.0 percent indium and 1.0 percent rhenium.

3,666,541
PROCESS FOR COATING WITH A VINYL FLUORIDE POLYMER
Roy A. Gray and Moses L. Thomas, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Mar. 19, 1970, Ser. No. 21,224
Int. Cl. B44d 1/36; C09d 3/78
U.S. Cl. 117—132 CF 8 Claims

High quality polyvinyl fluoride coatings are obtained by applying to a substrate a dispersion of polyvinyl fluoride in a latent solvent comprising sulfolane and water. Sufficient heat is then applied to coalesce the polymer and drive off the sulfolane and water.

3,666,542
PROCESS FOR THE PRODUCTION OF MICROPOROUS STRUCTURES
Koji Kigane, Nobuji Ishihara, and Atushi Kametaka, Mihara-shi, Japan, assignors to Teijin Limited, Osaka, Japan
No Drawing. Filed Jan. 28, 1970, Ser. No. 6,600
Claims priority, application Japan, Jan. 31, 1969, 44/7,088
Int. Cl. C08j 1/30
U.S. Cl. 117—135.5 8 Claims

Process for preparing a microporous structure wherein a dispersion of a polyurethane having hydrophilic polyoxyethylene segments in a solvent plus water is coated on a substrate and selectively evaporated.

3,666,543
TRIS-(2-HYDROXYALKYL)-PHOSPHINE OXIDE FLAME RETARDANT ARTICLES
Ludwig Maier. 17 Tiergartenstrasse, 8802 Kilchberg, Zurich Switzerland
No Drawing. Filed Nov. 18, 1970, Ser. No. 90,787
Claims priority, application Switzerland, Nov. 24, 1969, 17,554/69; Aug. 31, 1970, 12,973/70
Int. Cl. C09d 5/18; D06m 13/28; B32b 27/18
U.S. Cl. 117—136 3 Claims

Tris-(2-hydroxyalkyl)-phosphine oxides of the formula

$$(RCHCH_2)_3PO$$
$$\quad\quad|$$
$$\quad\quad OH$$

in which R signifies an alkyl group having 1 to 6 carbon atoms and having 0–6 halogen substituents are provided. A process for preparing these phosphine oxides and the use thereof as flameproofing agents are disclosed.

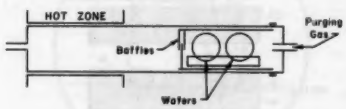
3,666,544
METHOD OF TREATING COTTON FOR FIRE RETARDATION
William L. Kuechler, Jenkintown, Pa., assignor to Proctor & Schwartz, Inc., Philadelphia, Pa.
No Drawing. Filed Mar. 12, 1970, Ser. No. 19,107
Int. Cl. C09k 3/28
U.S. Cl. 117—137 5 Claims

The method disclosed comprises the steps of first exposing the individual pores or fibers of a material as much as possible, then dispersing a desired hygroscopic powder, e.g., urea-diammonium phosphate with a free-flowing, anti-caking agent such as precipitated silica, into thorough contact with the exposed fibers, humidifying the exposed fibers to dissolve the powder and penetrate the fibers, e.g., by a fog obtained by mixing steam with saturated ambient air, and finally drying and/or curing the penetrated fibers to give rise to the desired characteristic imparted by the penetrating solution such as fire retardation. The hygroscopic powder is prepared by drying the constituents prior to pulverizing to reduce the moisture content thereof to less than ten percent, circulating hot air during the pulverizing process, and adding a free-flowing, anti-caking agent before or after the pulverizing process.

3,666,545
METHOD OF PRODUCING AN OPAQUE, LIGHT WEIGHT FABRIC AND RESULTANT FABRIC
John A. Pinatel, P.O. Box 490, Joliette, Quebec, Canada, and Georges A. Pascall, Montreal, Quebec, Canada; said Pascall assignor to said Pinatel
No Drawing. Filed July 15, 1969, Ser. No. 842,010
Claims priority, application Canada, July 26, 1968, 026,094
Int. Cl. B32b 27/36, 27/20
U.S. Cl. 117—138.8 F 4 Claims

A light weight spunbonded polyester fabric having a weight of about 1.2 to 1.4 oz./yd.^{2} has applied thereto a very thin film of opaquing material consisting of a self-crosslinking acrylic emulsion polymer of a colloidal dispersion of a vinyl chloride or a polysiloxane containing 20 to 30% by weight of an opaquing filler. About 1 oz. of dry opaquing solids is applied per square yard of fabric.

3,666,546
ION-FREE INSULATING LAYERS
James L. Reuter, East Fishkill, and Jagtar S. Sandhu, Fishkill, N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.
Filed May 1, 1970, Ser. No. 33,701
Int. Cl. C23c 11/06
U.S. Cl. 117—201 10 Claims



Ion contamination of insulators, such as thermally grown silicon dioxide layers on silicon wafers is virtually eliminated, if, after oxide growth, the wafers are cooled in an ion-free zone. A cylindrical, inner, quartz sleeve, preferably baffled, is interposed between the reaction tube and a wafer containing boat while a purging gas such as argon, nitrogen, helium and other inert gases is directed into the sleeve over the oxidized wafers to prevent contamination of the wafer by ions out-gassing from the walls of the reaction tube during the cooling cycle. Alternatively, the portion of the tube designated for wafer cooling is continuously baked before and during the oxide growth process and cooled simultaneously with the wafers thereby preventing the buildup of ions on the walls in the wafer cooling portion of the tube. Alternatively, a quartz sleeve is interposed between the wafer boat and reaction tube and extends from the hot zone and through the portion of the tube designated for wafer cooling. The inner sleeve is removed for wafer cooling.

3,666,547
PHOTO-CATHODES FOR ELECTRONIC DISCHARGE TUBES

Thomas Murphy, Purley, England, assignor to U.S. Philips Corporation

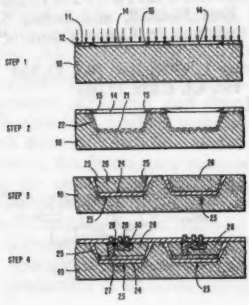
Filed Mar. 30, 1970, Ser. No. 23,785
Claims priority, application Great Britain, Mar. 31, 1969, 16,735/69
Int. Cl. H01j *39/06*
U.S. Cl. 117—201 4 Claims

A method of manufacturing an electric discharge tube having a photocathode in which a source of the photocathode material coated with a sealant inert to the photocathode material is placed within an evacuated envelope which is then heated first to a bake-out temperature and then to a higher cathode-forming temperature.

3,666,548
MONOCRYSTALLINE SEMICONDUCTOR BODY HAVING DIELECTRICALLY ISOLATED REGIONS AND METHOD OF FORMING

Karl Brack, Fishkill, Edward F. Gorey, Beacon, and Guenther H. Schwuttke, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 821,908, May 5, 1969. This application Jan. 6, 1970, Ser. No. 883
Int. Cl. H01l *7/00*
U.S. Cl. 117—212 8 Claims

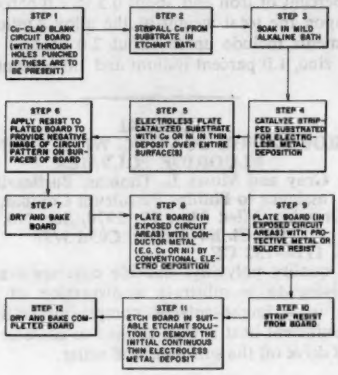


A monocrystalline semiconductor body has a single, continuous insulating layer extending from the surface to a selected depth in the body and surrounding a region of the body to dielectrically isolate the region, which has one surface formed by the surface of the body, from the remainder of the body. The insulating layer is produced by bombarding the body with ions, which react with atoms in the body when heated to a predetermined temperature. The ions are directed through an opening in a mask and a beveled surface of the mask surrounding the opening. The beveled surface controls the penetration of the ions from the surface of the body into the body to the sub-surface layer of the ions directed through the opening in the mask. When the body is heated to the selected temperature, the embedded ions react with the atoms in the body to produce the insulating layer and dielectrically isolate the region, which is surrounded by the single, continuous layer, from the remainder of the body.

3,666,549
METHOD OF MAKING ADDITIVE PRINTED CIRCUIT BOARDS AND PRODUCT THEREOF

Harold L. Rhodenizer, Bethlehem, John J. Grunwald, New Haven, and William P. Innes, Cheshire, Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Filed May 9, 1969, Ser. No. 823,354
Int. Cl. C23c *3/02*
U.S. Cl. 117—212 9 Claims


STEP 1
Cu-CLAD BLANK CIRCUIT BOARD (WITH THROUGH-HOLES PUNCHED IF THESE ARE TO BE PRESENT)
STEP 2
STRIP ALL Cu FROM SUBSTRATE IN ETCHANT BATH
STEP 3
SOAK IN MILD ALKALINE BATH
STEP 4
CATALYZE STRIPPED SUBSTRATE FOR ELECTROLESS METAL DEPOSITION
STEP 5
ELECTROLESS PLATE CATALYZED SUBSTRATE WITH Cu OR Ni IN THIN DEPOSIT OVER ENTIRE SURFACE(S)
STEP 6
APPLY RESIST TO PLATED BOARD TO PROVIDE NEGATIVE IMAGE OF CIRCUIT PATTERN ON SURFACES OF BOARD
STEP 7
DRY AND BAKE BOARD
STEP 8
PLATE BOARD (IN EXPOSED CIRCUIT AREAS) WITH CONDUCTOR METAL (E.G. Cu OR Ni) BY CONVENTIONAL ELECTRO DEPOSITION
STEP 9
PLATE BOARD (IN EXPOSED CIRCUIT AREAS) WITH PROTECTIVE METAL OR SOLDER RESIST
STEP 10
STRIP RESIST FROM BOARD
STEP 11
ETCH BOARD IN SUITABLE ETCHANT SOLUTION TO REMOVE THE INITIAL CONTINUOUS THIN ELECTROLESS METAL DEPOSIT
STEP 12
DRY AND BAKE COMPLETED BOARD

A method is disclosed for forming printed circuit boards using the additive process. Improvement over the prior art is obtained in respect to adhesion of the conductor metal circuit to a thermoset resin substrate. In the process, a nickel or copper clad thermoset resin substrate is stripped of all metal, activated (catalyzed), a resist pattern applied to obtain the desired circuit and a conductor metal deposited on the circuit area by electroless and/or electrodeposition to a final desired thickness. At one or more points in the process the board is heated or baked. Various types of circuit boards resulting from the process are also disclosed.

3,666,550
TEXTILE MATERIALS HAVING DURABLE ANTISTATIC PROPERTIES

Tomomi Okuhashi and Shigeru Fujiwara, Hino-shi, Tokyo, Japan, assignors to Teijin Limited, Kita-ku, Osaka, Japan

No Drawing. Filed May 24, 1968, Ser. No. 731,738
Int. Cl. D06q *1/04*
U.S. Cl. 117—217 6 Claims

A textile material having durable antistatic properties, said material comprising organic textile fibers and a minor amount of electrically conductive fibers, each of said electrically conductive fibers comprising a substrate of organic synthetic fiber and a metallic coating chemically deposited thereon, said electrically conductive fiber possessing the functional properties of textile fibers.

3,666,551
IMPREGNATING AND COATING COMPOSITION FOR POROUS CERAMIC INSULATION

Lawrence G. Bockstie, Jr., Bradford, Pa., assignor to Corning Glass Works, Corning, N.Y.

No Drawing. Original application Dec. 8, 1967, Ser. No. 688,974, now Patent No. 3,575,916, dated Apr. 20, 1971. Divided and this application Dec. 4, 1969, Ser. No. 882,352
Int. Cl. B44d *1/18*; H01b *3/00*
U.S. Cl. 117—218 19 Claims

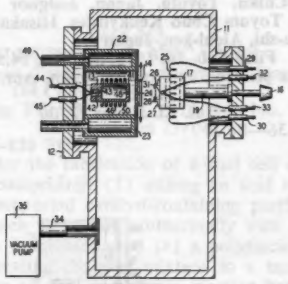
A coating and impregnating composition suitable for providing a water repellent, abrasion, scratch, chip and

dirt resistant coating on a ceramic insulating surface comprising a solvent, a suspension of a resin, a silicone and a partially hydrolyzed tetra-alkyl orthosilicate.

3,666,552
METHOD FOR GIVING ELECTRIC CONDUCTIVITY TO NON-CONDUCTOR
Buichiro Ayukawa, Tokyo, Japan, assignor to Shikoku Paper Manufacturing Co., Iyomishima-shi, Japan
No Drawing. Filed Nov. 16, 1970, Ser. No. 90,019
Claims priority, application Japan, Dec. 3, 1969, 44/97,092
Int. Cl. B44d *1/18*; C23c *3/00*
U.S. Cl. 117—227 50 Claims

A method for imparting electric conductivity to a non-conductor comprises depositing copper on its surface by heating the non-conductor at a temperature not exceeding 100° C. in an aqueous solution of a complex of cuprous thiocyanate and thiourea. In the case of an absorbent non-conductor, the latter can be treated with an aqueous or organic solution of the complex at room temperature, the non-conductor is made alkaline at a temperature not exceeding 100° C. by exposing it to ammonia gas, whereupon copper is deposited within and on the surface of the non-conductor.

3,666,553
METHOD OF GROWING COMPOUND SEMICONDUCTOR FILMS ON AN AMORPHOUS SUBSTRATE
John Read Arthur, Jr., Murray Hill, and Francis Joseph Morris, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 8, 1970, Ser. No. 35,748
Int. Cl. B44d *1/18*
U.S. Cl. 117—229 13 Claims



The growth of high sheet resistance thin films of Group III(a)-V(a) semiconductor compounds is effected in an ultra-high vacuum by directing beams of the constituent elements at an amorphous substrate preheated to temperatures ranging from 250° C.–450° C. The described process is a nonequilibrium growth technique which permits the growth of non-epitaxial films of controllable thickness.

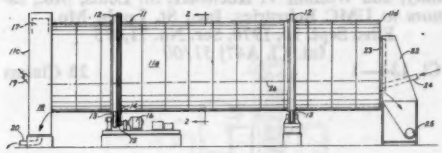
3,666,554
MANUFACTURE OF ELECTROPHOTOGRAPHIC PLATE
Kay Keiji Kanazawa and George Bryan Street, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
No Drawing. Filed Dec. 10, 1970, Ser. No. 97,007
Int. Cl. G03g *5/04, 13/22*
U.S. Cl. 117—230 4 Claims

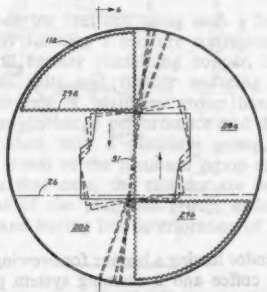
A process for preparing an electrophotographic plate by evaporating under vacuum onto a conductive substrate held at a temperature of from 50° C. to 80° C. a layer consisting essentially of equal atomic proportions of selenium and sulfur.

3,666,555
OXIDATION RESISTANT GRAPHITE AND CARBON SHAPES
William P. Jones, McMurray, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.
No Drawing. Filed Feb. 8, 1968, Ser. No. 703,862
Int. Cl. B44d *1/20*
U.S. Cl. 117—228 6 Claims

Composite carbon shapes for use at elevated temperatures in an oxidizing atmosphere comprising carbon shapes and a coating comprising particulate aluminosilicate refractory bonded together and to the surface of the carbon shape with phosphoric acid.

3,666,556
DIFFUSION APPARATUS WITH POSITIVE FLOW CONTROLS
Clarence R. Steele, Denver, Colo., assignor to CF & I Engineers, Inc., Denver, Colo.
Filed Jan. 21, 1970, Ser. No. 4,689
Int. Cl. C13d *1/12*
U.S. Cl. 127—7 8 Claims



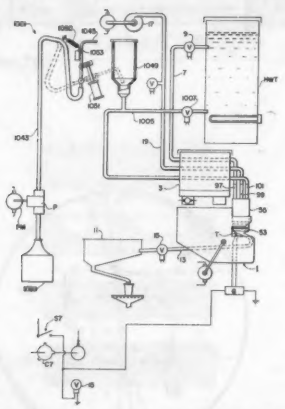


Drum type, liquid-confining tank mounted for rotation about a substantially horizontal axis of rotation and having a solution inlet and a pulp discharge outlet at one end and a pulp inlet and a juice outlet at its opposite end maintaining approximately a one-third fill of pulp in said tank. Partitioning means extend through the tank interior in spiral pattern inclusive of a pair of segmental division plates defining each cell, the latter having an opening formed in one plate to provide the segmental shaping and maintain a juice flow path for discharge from the cell. Means for rotating tank and cells. A screening member in each segment is closed on three sides and one end with its other end open for delivering pulp to a chute member directing it to the succeeding cell. Juice passing the screen is directed in the opposite direction to a succeeding cell.

3,666,557
NOVEL STARCH GELS AND PROCESS FOR MAKING SAME
Edward R. Jensen, Hinsdale, John E. Long, Western Springs, and Leamon D. Williams, Palos Heights, Ill., assignors to CPC International Inc.
No Drawing. Filed Nov. 10, 1969, Ser. No. 875,545
Int. Cl. A23l *1/06*; C13l *1/08*
U.S. Cl. 127—32 4 Claims

Starch gels which approximate closely, in physical appearance, in mouthing characteristics, and in structure, gels made from gelatin, are prepared by subjecting an aqueous slurry of an amylose-containing starch which has a bound fat content of less than about 0.3% to a relatively high temperature (generally between about 158° F. and 220° F.) and a high degree of shear. The conditions of temperature and degree of shear should be such as to cause substantially complete disruption of the starch granules coupled with substantially no molecular degradation. The resulting starch gels can be used as extenders or complete replacements for gelatin in many applications in which gelatin is customarily employed, e.g. in food products such as molded salads and desserts, in the manufacture of hard capsules, and as encapsulating agents in the microencapsulation of sensitive materials.

3,666,558
COFFEE VENDOR
Harry H. Pryor, St. Louis, William H. Short, St. Louis County, and William V. Koeneker, St. Louis, Mo., assignors to UMC Industries, Inc., St. Louis, Mo.
Filed Sept. 10, 1970, Ser. No. 71,075
Int. Cl. A47j *31/00*
U.S. Cl. 134—1 23 Claims

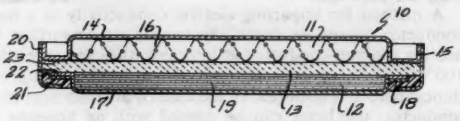


A coffee vendor having a brewer for brewing fresh coffee from ground coffee and a cleaning system providing for delivery of a charge of hot water and a cleaning agent to the brewer and retaining the charge in the brewer, followed by two rinses of the brewer each involving delivery of a charge of hot water to the brewer and retaining this charge for a rinse interval, and having either an ultrasonic transducer or a mechanical system for pulsating these charges in the brewer for better cleaning, pulsation also being applicable to the charge of hot water in the brewer during brewing for better brewing of coffee.

3,666,559
SURFACE TREATMENT OF GLASS-CERAMICS
Joseph J. Domicone, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.
No Drawing. Filed July 2, 1970, Ser. No. 52,117
Int. Cl. C23g *1/02*
U.S. Cl. 134—3 6 Claims

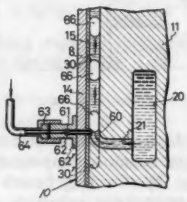
A method of removing metal marks from the surface of a glass-ceramic material by treating the material with an aqueous solution of gluconic acid at elevated temperatures.

3,666,560
ELECTROCHEMICAL POWER-PRODUCING CELL
Elton J. Cairns, Downers Grove, Albert A. Chilenskas, Western Springs, Robert K. Steunenberg, Naperville, and Hiroshi Shimotake, Hinsdale, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Sept. 21, 1970, Ser. No. 73,830
Int. Cl. H01m *35/02*
U.S. Cl. 136—6 4 Claims



An electrochemical power-producing cell including a molten lithium metal anode, a molten selenium metal cathode, a paste electrolyte separating the anode from the cathode, an anode current collector and a single layer of niobium expanded metal formed in corrugated shape as cathode current collector. In addition means are provided for sealing the anode and the cathode from loss of lithium and selenium respectively and an insulator is provided between the anode housing and the paste electrolyte disk.

3,666,561
ELECTROLYTE CIRCULATING BATTERY
Takewo Chiku, Toyota, Japan, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Hisakata, Showa-ku, Nagoya-shi, Aichi-ken, Japan
Filed Feb. 26, 1970, Ser. No. 14,551
Claims priority, application Japan, Apr. 11, 1969, 44/28,545
Int. Cl. H01m *27/00*
U.S. Cl 136—86 R 9 Claims

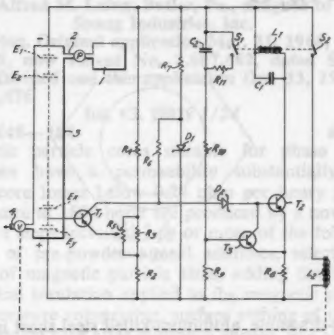


An electrolyte circulating battery having a plurality of cells electrically connected in series and supplied with circulating electrolyte, wherein there is provided a main electrolyte inlet passage and branched inlet passages leading therefrom to each cell, and branched outlet passages leading from each cell to a main electrolyte outlet passage, the branched inlet and outlet passages being made sufficiently long and of sufficiently small cross-section to prevent passage of any substantial amount of internal current between cells. Gas, such as air and oxygen, is introduced into the branched inlet end and/or outlet passages through needles to form bubbles in the electrolyte, thereby further increasing the electric resistance in said branched passages.

3,666,562
FUEL CELL WITH CONTROL SYSTEM AND METHOD

Dietrich Sprengel, Kelkheim, Taunus, Germany, assignor to Varta Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 3, 1969, Ser. No. 803,557
Claims priority, application Germany, Mar. 15, 1968, P 16 96 554.1
Int. Cl. H01m *27/12*
U.S. Cl. 136—86 B 15 Claims



A control system is provided for improving the venting of accumulated inert gas from electrochemical energy conversion means such as fuel cell batteries. The venting period is initiated by a drop in cell potential but is independent of cell potential recovery time.

3,666,563
ELECTRODE FABRICATION

Ahmad Sam, Paramus, N.J., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,086
Int. Cl. H01m *13/04*
U.S. Cl. 136—120 FC 8 Claims

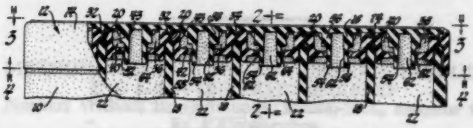
A process for the fabrication of a fuel cell electrode, said process comprising: (1) adding an acid to a mixture of (a) supported catalyst-containing particles, (b) a material which will react exothermally with said acid when reaction is initiated, and (c) a polymeric thermoplastic; (2) heating the acid mixture to a temperature sufficient to set off said exothermic reaction between the acid and the reactive material, causing the thermoplastic to become fluid and adherent; and (3) subjecting the reacted acid mixture to pressure, thus bonding said particles together.

3,666,564
BATTERY COVER WITH INTEGRAL VENTING SYSTEM

Ralph L. Corbin, Richard A. Jones, and Robert G. Byers, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1969, Ser. No. 857,342
Int. Cl. H01m *1/06*
U.S. Cl. 136—170 4 Claims

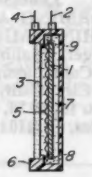
A multicell casing is disclosed which has a covering assembly comprising a cover member, a unitary filler cap member and a venting system for separating and collecting electrolyte from emanated gas. In the venting system disclosed, each cell has its own elongated horizontal vent chamber containing slush baffles. Each vent chamber is in fluid communication with a longitudinally extending horizontal manifold. The slush baffles are integral with the unitary filler cap member which is flushly seated within the covering member to form an upper wall for the individual vent chambers.



3,666,565
METHOD FOR PREPARING AN ELECTRODE FOR FUEL CELL

Masataro Fukuda, Toyonaka-shi, and Tsutomu Iwaki, Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 22, 1969, Ser. No. 887,043
Claims priority, application Japan, Dec. 26, 1968, 43/667; Nov. 10, 1969, 44/28,767; Apr. 30, 1969, 44/34,373; Sept. 18, 1969, 44/75,582
Int. Cl. H01m *13/04;* C22b *3/00;* C23c *3/02*
U.S. Cl. 136—120 FC 11 Claims



An electrode for fuel cell using such a fuel hydrazine is prepared by forming a mixture containing nickel and antimony, and further containing copper, iron, etc., by reducing their salts and further reducing the mixture after a metal salt of platinum group has been added thereto. Better discharge performance and durability can be obtained than with a platinum group, though the amount of a metal of the platinum group to be added is decreased. In that case, the carriers are better carriers for the metal of the platinum group, endowing a promoter effect and having less deterioration of the electrode function.

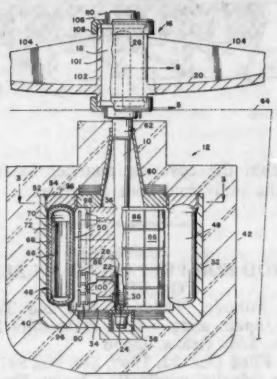
3,666,566
THERMALLY CASCADED THERMOELECTRIC GENERATOR

T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert Flaherty, Pittsburgh, Pa.

Filed July 24, 1969, Ser. No. 844,355
Int. Cl. G21h *1/10;* H01v *1/02*
U.S. Cl. 136—202 15 Claims

A thermally cascaded thermoelectric generator is disclosed. The generator includes a first stage containing high-temperature thermoelectric elements and a second stage containing lower temperature thermoelectric elements. The stages are connected in thermal series by means of an elongated heat transfer pipe containing a liquid metal and a wick. A portion of the heat radiated to the first stage from a high-temperature radioisotope source is converted to electricity. The heat rejected by the first stage is conducted to the heat pipe and absorbed by the liquid metal as latent heat of vaporization. The vapor rises to

the second stage and condenses to give up latent heat of condensation which is transferred to the second stage



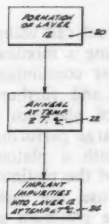
and is converted to electricity therein. The condensed liquid returns on the wick to the vicinity of the first stage.

3,666,567

METHOD OF FORMING AN OHMIC CONTACT REGION IN A THIN SEMICONDUCTOR LAYER

Robert G. Hunsperger, Malibu, and Ogden J. Marsh, Woodland Hills, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 15, 1970, Ser. No. 3,156
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 **3 Claims**



A method of providing an ohmic contact region in a thin doped semiconductor layer is disclosed. After the layer is formed in the semiconductor substrate and the substrate is annealed, impurities are implanted into the layer at room temperature, thereby creating a defect region in the layer which provides good ohmic contact to the layer.

3,666,568

METHOD OF IMPROVING PUNCHABILITY OF STEEL SHEETS

Hiroshi Shimanaka and Toshio Irie, Chiba, Toshikuni Tanda, Akashi, and Tomoyuki Ichi, Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed June 16, 1970, Ser. No. 46,619
Claims priority, application Japan, June 24, 1969, 44/49,519
Int. Cl. C23f 7/26
U.S. Cl. 148—6.2 **10 Claims**

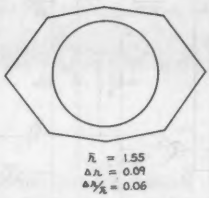
A method of improving the punchability of electrical steel sheets and the like, by applying a first layer on the steel sheets, which contains one or more of chromic acid, chromates, and bichromates, and a second layer consisting of varnish on the first layer.

3,666,569

PRODUCTION OF DEEP DRAWING STEEL

Frank A. Hultgren, North Royalton, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed June 18, 1969, Ser. No. 834,369
Int. Cl. C21d 9/48; C22c 39/00
U.S. Cl. 148—12 **17 Claims**



Deep-drawable, aluminum-killed steel sheet is produced to be substantially non-earing by procedure wherein after hot rolling to a finish temperature of at least about 1500° F. and coiling at a temperature not higher than about 1100° F., the steel is cold reduced by an amount between about 50% and 80% and then annealed by a first step of heating to a temperature in the range between about 1030° F. and 1090° F. for at least two hours, advantageously six hours, and then heating the sheet to a temperature below the lower critical point, for softening.

3,666,570

HIGH-STRENGTH LOW-ALLOY STEELS HAVING IMPROVED FORMABILITY

Michael Korchynsky, John David Grozier, and John L. Mihelich, Bethel Park, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed July 16, 1969, Ser. No. 842,407
Int. Cl. C22c 39/54
U.S. Cl. 148—36 **9 Claims**

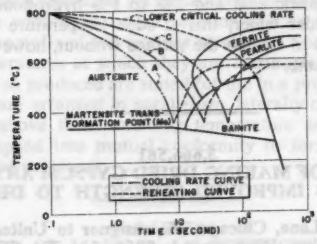
Fully killed high-strength low-alloy steels consisting essentially of .06% to .20% carbon, .50% to 1.4% manganese, .01% to .08% columbium or .04% to .12% vanadium, .05% maximum silicon, .04% maximum sulfur, .04% maximum phosphorus and an inclusion shape-control agent comprising either .06% to .20% zirconium, .01% to .10% of a rare earth or .01% to .10% mischmetal are characterized in a hot-rolled finished condition by yield strengths in excess of 45,000 p.s.i., ultimate tensile strengths in excess of 60,000 p.s.i., ductilities as measured by percent elongation (2 inches) in excess of 20%,

good toughness, superior formability and reduced directionality. The steels are hot-rolled finished in the temperature range 1550° F. to 1650° F., cooled at a rate within the range 20° F. to 135° F. per second and collected by coiling or piling within a temperature range of 1025° F. to 1175° F.

3,666,571
MAGNETIC PARTICLE CORE MANUFACTURING PROCESS
Alfred M. Laing, Butler, Pa., assignor to Spang Industries, Inc.
No Drawing. Original application Mar. 21, 1968, Ser. No. 714,805, now Patent No. 3,607,462, dated Sept. 21, 1971. Divided and this application Oct. 13, 1970, Ser. No. 80,476
Int. Cl. H01f 1/24
U.S. Cl. 148—104 6 Claims

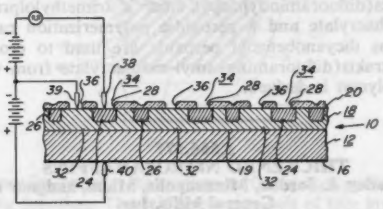
Magnetic particle cores suitable for phase shifting applications have a permeability substantially above 275 and core losses below 0.24 ohm per henry per unit of inductance at 1800 hertz are produced by a novel combination of steps including one or more of the following: reduction of pre-powder anneal additives, selective distribution of magnetic particle sizes, adding flexibility to the electrical insulation applied to the magnetic particles, elevated pressure compacting, surface etching of the pressure compacted core after hydrogen anneal, and an oxidation heat treatment following surface etching. Surface etching and oxidation combine to increase the breakstrength and improve other properties of various permeability cores, for example, from 125 through 300 permeability.

3,666,572
PROCESS FOR THE CONTINUOUS HEAT TREATMENT OF A LOW ALLOY STEEL WIRE MATERIAL
Akira Nakagawa, Tokyo, and Kazumasa Inoue, Saitama-ken, Japan, assignors to Suzuki Metal Industry Co., Ltd., Tokyo, Japan
Filed Jan. 21, 1969, Ser. No. 792,661
Claims priority, application Japan, Jan. 24, 1968, 43/3,733
Int. Cl. C21d 1/18
U.S. Cl. 148—134 5 Claims



A process for continuously heat treating a wire, rod, bar and strip material made of low alloy steel such as a chromium-vanadium, chromium-silicon and boron steel, characterized by heating the material to a temperature not lower than its A_3 transformation point, cooling the heated material at a suitable cooling rate not lower than its lower critical cooling rate, the former cooling rate being suitably determined depending on the kind of steel and the diameter or thickness of the material, to a temperature right above its Ms point, and then reheating the cooled material to a temperature not higher than its A_1 transformation point, thereby rendering the material mainly fine-pearlitic in structure; and a low alloy steel treated by the process.

3,666,573
METHOD FOR MAKING TRANSISTORS INCLUDING GAIN DETERMINING STEP
Norbert William Brackelmanns, Ironia, N.J., assignor to RCA Corporation
Filed Dec. 17, 1969, Ser. No. 885,699
Int. Cl. B01j 17/00; H01l 7/00, 7/36
U.S. Cl. 148—175 6 Claims



The method includes providing a uniformly thick base layer on a wafer of semiconductor material which is to become transistor collectors, and diffusing a plurality of separate emitter regions into the base layer. During emitter diffusion, a grid of like conductivity is diffused into the base layer and between adjacent emitter regions to isolate the active region of each transistor. A gain figure-of-merit is then measured for one transistor in the wafer, and if below a desired minimum, the emitter regions are rediffused. After achieving the desired gain, the transistors are separated from the wafer.

3,666,574
PHOSPHORUS DIFFUSION TECHNIQUE
Krishan S. Tarneja, Pittsburgh, Pa., Vito A. Rossi, Hawthorne, Calif., and James B. McNally, Irwin, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 6, 1968, Ser. No. 757,852
Int. Cl. H01l 7/36, 7/44
U.S. Cl. 148—188 8 Claims

Webbed dendritic material having clean shiny surfaces after diffusion and post-diffusion cleaning processes is made possible by embodying a diffusion process which first forms an oxide coating on the surfaces and then diffuses the impurity into the webbed dendritic material through the oxide coating.

3,666,575
SOLID PROPELLANT COMPOSITION WITH BURNING RATE CATALYST
Harold M. Fisher, Charlotte, N.C., assignor to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Mar. 10, 1970, Ser. No. 18,321
Int. Cl. C06d 5/06
U.S. Cl. 149—19 8 Claims

Free radicals that catalyze the burning rate of propellants. Specifically, the free radical compound, 2,2-diphenylpicrylhydrazyl, increases the burning rate of propellant compositions comprised of the specified free radical compound and other major propellant ingredients consisting of the inorganic oxidizer ammonium perchlorate, polybutadiene binder, optional catalysts (e.g., n-butyl ferrocene or Fe_2O_3), and aluminum metal powder. Processing aids (e.g., lecithin) and curatives may be used in minor amounts in the basic formulation or as an additive to the propellant composition.

3,666,576

EXPLOSIVE COMPOSITION CONTAINING AN ENERGETIC ACRYLATE AS BINDER

Lawrence J. Engel, Green Brook, N.J., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Continuation-in-part of application Ser. No. 671,165, Sept. 27, 1967. This application Apr. 30, 1970, Ser. No. 43,619

Int. Cl. C06b *11/00*

U.S. Cl. 149—19 9 Claims

An improved energetic propellant charge, of the solid type useful in rockets and rocket motors may be formulated with a system of the polymer of tetrakis(difluoramino)amyl methacrylate and a large amount of hexakis(difluoramino)propyl ether if trimethylolpropane trimethacrylate and a peroxidic polymerization catalyst such as dicyanobenzoyl peroxide are used to crosslink the tetrakis(difluoramino)amyl methacrylate from which the polymer is derived.

3,666,577

THICKENED NITROPARAFFINS

Wesley A. Jordan, Minneapolis, Minn., assignor to General Mills, Inc.

No Drawing. Filed Dec. 23, 1969, Ser. No. 887,744

Int. Cl. C06b *7/00*

U.S. Cl. 149—89 8 Claims

A cyanoethyl ether of a galactomannan gum having a degree of substitution (D.S.) of greater than 1.9 is used to thicken nitroparaffins which are in turn used in explosives and rocket fuels.

3,666,578

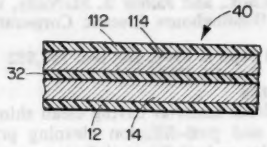
PRODUCTION OF HIGH MODULUS LAMINATES

Earl E. Chadsey, Jr., Sudbury, and Frank Feakes, Lexington, Mass., assignors to National Research Corporation, Cambridge, Mass.

Filed Sept. 29, 1969, Ser. No. 861,943

Int. Cl. B32b *15/08*; B44d *1/34*; C23c *13/02*; C23f *1/00*

U.S. Cl. 156—3 7 Claims



Laminates of repeating elements of stiff reinforcement are produced by coating the stiff reinforcement onto a very thin resin substrate. The resin substrate is applied in fluid form as a pre-coat to a temporary heavy substrate. The pre-coated substrate is overcoated with the stiff reinforcement to a thickness in excess of resin thickness. Then the temporary substrate is removed and the elements of resin/stiff material are laid up into a laminate. The resultant laminate is characterized by high volume fraction of the stiff material and limited weight of the resin due to its low density and limited volume fraction in the laminate.

3,666,579

ETCHING ELECTRODES

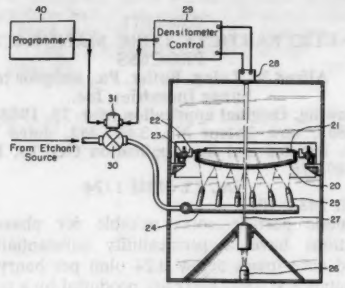
Leonard Dietch, Skokie, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 15, 1970, Ser. No. 46,354

Int. Cl. C23f *1/02*

U.S. Cl. 156—16 8 Claims

A shadow mask used in screening a color picture tube is re-etched in a multistation apparatus to have holes of larger size than the phosphor dots. A densitometer, positioned in an intermediate etching stage, measures the transmissivity of the mask to light and controls the etching process to achieve the desired hole size. An etchant is sprayed into that stage to maintain substantially constant



atmospheric conditions therein and thereby avoid changes in calibration of the densitometer that are attributable to varying response of the shadow mask material to the etchant or to operating conditions which otherwise lead to incorrect final hole size in the mask.

3,666,580

CHEMICAL MILLING METHOD AND BATH

John F. Kreml, Phoenix, Md., John M. Leibel, Hicksville, N.Y., and George C. Pierpont, Ellicott City, Md., assignors to Armco Steel Corporation, Middletown, Ohio

No Drawing. Filed Mar. 20, 1969, Ser. No. 809,027

Int. Cl. C23f *1/00*

U.S. Cl. 156—18 6 Claims

Chemical milling of titanium and titanium alloys by immersing the same in a bath comprising 2% to 7% by volume hydrofluoric acid, 1% to 10% by volume hydrochloric acid, with remainder water, for such time, and at such temperature as to remove a desired quantity of metal and yield a dull satinlike finish. For a best surface finish, immersion in the hydrofluoric acid-hydrochloric acid bath is followed by immersion in a bath comprising 5% to 20% by volume nitric acid and 2% to 5% hydrofluoric acid, with remainder water, this at such temperature and for such time as to cleanse the surface without, however, polishing the same.

3,666,581

METHOD OF MAKING DRIED GYPSUM ARTICLES HAVING IMPROVED STRENGTH TO DENSITY RATIO

Marvin K. Lane, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,330

Int. Cl. B32b *13/00*

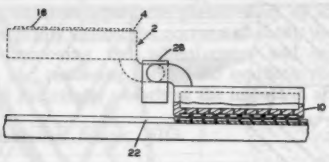
U.S. Cl. 156—39 3 Claims

The process of making dried gypsum articles having an increased strength to density ratio and which can be cast from an aqueous slurry of calcined gypsum that contains less water for the same fluidity, by providing a specially sized calcined gypsum which contains 0% to 7% by weight of particles larger than 32 microns and 0% to 8% by weight of particles smaller than 1 micron, forming a slurry at usable fluidity after mixing vigorously with accelerator and casting while the sized calcined gypsum has a combined moisture content of less than 9% by weight.

3,666,582
CHIP PLACEMENT IN A GRID PATTERNED SHEET

Harold L. Kauffman, Lititz, and Richard M. Hisey, Lancaster. Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 28, 1970, Ser. No. 32,561
Int. Cl. B44c *1/28*
U.S. Cl. 156—63 3 Claims



The sheet material is provided with a plurality of pockets in a grid-like pattern. A plurality of chips sized to fit in the pockets are positioned upon the sheet material. The chips are placed in a prearranged pattern before being placed upon the sheet material so that when the chips are positioned upon the sheet material they are placed directly in the pockets of the sheet material. A grid pattern template is used to secure the chips in the particular pattern desired, and this pattern is the same as that of the pockets of the sheet material. A vacuum transfer is then used to transfer the arranged chips from the template to the sheet. The chips are now consolidated to the sheet material by appropriate heat and pressure.

3,666,583
METHOD FOR MAKING AND ASSEMBLING SEALED TUBULAR BODIES

Yu Kun Pei and Frank Veres, Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed Apr. 22, 1970, Ser. No. 30,855
Int. Cl. B29c *25/00*
U.S. Cl. 156—82 15 Claims

Sealed sections of thermoplastic tubing, such as glass tubing, are formed by directing a cutting flame against a continuously moving length of tubing. The flame-emitting burner and the tubing move along parallel paths and at the same velocity.

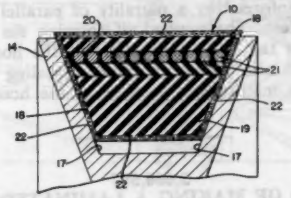
A continuous length of tubing is cooled before being divided into individual sealed sections, so that the internal pressure within the sealed sections will be sufficient to cause the walls of the sections to expand when subjected to temperatures at which they are thermoplastic. Tubing sections so produced are suited for use in a process wherein they are arranged in parallelism, laterally confined and heated above their softening temperature so that their walls expand into mutual conformity to form a honeycomb-like structure.

3,666,584
METHOD OF MAKING AN EXTENSIBLE POWER TRANSMISSION BELT

Sidney R. Fix, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar 5, 1970, Ser. No. 26,457
Int. Cl. B32b *31/26*
U.S. Cl. 156—84 7 Claims

An extensible belt, particularly a power transmission belt, containing a tension section of longitudinally extending individual textile cords which include synthetic thermoplastic filamentary material in their structure. The cords are simultaneously relaxed and heat-treated in the absence of applied tension and are thereby capable of an initial stretch or elongation within certain defined limits and a subsequent recovery of at least a substantial portion of the initial stretch. The cords are subsequently incorporated into the belt and the vulcanized belt is thereby made extensible within certain defined limits and capable of being stretched in order to be installed in a belt drive assembly. After the initial stretch, the belt subsequently retracts or recovers to the driving position with respect to the pulleys and retains sufficient tension to



frictionally engage the pulley surfaces and perform its driving function. The self-tensioning belt of this invention eliminates the need for tensioning devices or means to adjust the drive to provide the proper tension required when conventional transmission belts are employed and is particularly useful in applications involving V-type transmission belts which are designed to operate with grooved pulleys or sheaves.

3,666,585
LAMINATED AMORPHOUS AND CRYSTALLINE POLYPROPYLENE SHEETING

Herbert S. Barbehenn and Robert F. Williams, Jr., Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Nov. 22, 1968, Ser. No. 778,330, now Patent No. 3,607,616, dated Sept. 21, 1971. Divided and this application Jan. 5, 1971, Ser. No. 48,599
Int. Cl. B32b *31/00*
U.S. Cl. 156—85 1 Claim

A laminated polypropylene sheeting having physical properties comparable to those of crystalline polypropylene sheeting and comprising a core of polypropylene fiber batting impregnated with amorphous polypropylene laminated to at least one and preferably between two sheets of crystalline polypropylene is disclosed.

3,666,586
CORD REINFORCED HOSE SPLICING METHOD

Edward H. Lacey, P.O. Box 796, Trent, S. Dak. 57065

Continuation-in-part of abandoned application Ser. No. 874, Jan. 6, 1970. This application Nov. 10, 1970, Ser. No. 88,420
Int. Cl. B32b *35/00*
U.S. Cl. 156—98 6 Claims

A splice for cord reinforced hoses such as those employed in irrigation systems as a supply hose which is dragged along the supporting surface of an area being irrigated by the irrigation apparatus including an internal

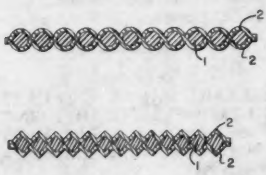
and external laminated splice assembly and a procedural step including the tying of the reinforcing cords employed in the hose by the use of non-slip knots to form a splice which is as strong as if not stronger than the original hose. An internal expansible balloon member is employed to place and retain the internal lamination in place and the external lamination is bonded in place with the curing step effectively vulcanizing the internal lamination and the external lamination to the hose to provide a seal for the splice. The internal expansible member includes a resilient tubular member of elongated construction reinforced by a plurality of parallel cords embedded therein. The method of forming the splice not only secures the reinforcing cords of the hose together by tying but also forms a reinforced sealing lamination on both the interior and exterior of the hose.

3,666,587

METHOD OF MAKING A LAMINATED LIGHT-CONDUCTING FIBER MATERIAL

Kazuyoshi Nagao, Yokohama, Japan, assignor to American Optical Corporation, Southbridge, Mass.

Filed Sept. 29, 1969, Ser. No. 861,871
Int. Cl. B31f *1/00*
U.S. Cl. 156—199 **4 Claims**



Plastic light-conducting fiber ribbons are formed of a transparent high refractive index strip of plastic material covered with thin films of relatively low refractive index plastic material. The covered strip is heated and rolled to the configuration of a multiplicity of interconnected juxtaposed fibers from which monofilaments may be cut longitudinally of the ribbon.

3,666,588

METHOD OF RETAINING AND BONDING ARTICLES

William R. Wanesky, Wescosville, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,829
Int. Cl. B32b *31/26*
U.S. Cl. 156—155 **9 Claims**

Beam-lead integrated-circuit chips are held in desired locations on substrates through the use of high purity glycerol as an adhesive. The beam leads of the chip are precoated with glycerol and the chips are placed at a desired location. If the desired location is to be permanent the chip can be bonded with conventional thermocompression bonding technique and the glycerol will be evaporated leaving no undesirable residues. Thus, the glycerol does not interfere with the bonding.

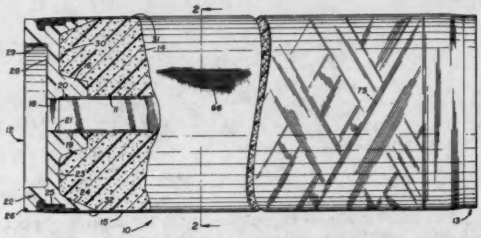
If the location is to be temporary, extremely fragile chips can be removed by lifting the chip with a heated vacuum pickup. Contact of the chip with a heated pickup evaporates the glycerol and the chip comes away from the substrate quite readily. Less fragile chips can be removed without evaporation of the glycerol.

3,666,589

METHOD FOR MAKING INDUSTRIAL ROLLS

Sterling W. Alderfer, Akron, Ohio, assignor to Teledyne, Inc., Los Angeles, Calif.

Original application July 1, 1968, Ser. No. 741,727, now Patent No. 3,571,878. Divided and this application Mar. 2, 1970, Ser. No. 18,535
Int. Cl. B65h *81/02*
U.S. Cl. 156—172 **2 Claims**



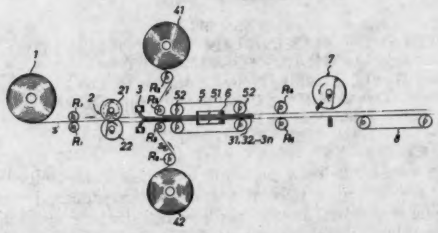
The improved industrial roll has axially spaced, preferably elastomeric, cylindrical head members with a beam extending therebetween. A core, preferably of rigid urethane foam, extends cylindrically between the head members and encases the beam. The head members and core are, in turn, encased within a skin that is preferably a filled polyester resin, the skin being locked to the head members. A coupling may be utilized to assist with torsional load transfer between the beam and each head member, and blades may be used to transfer such loads between the beam and the core. To make such a roll, the head members are positioned at the ends of a beam and a core is molded around the beam and between the head members. The resulting skeletal roll is then provided with the skin that locks the head members to the core. The apparatus for applying the skin comprises a winder for wrapping a ribbon-like skin component helically about the skeletal roll. Sufficient wraps are made completely to encase the core, and a drive mechanism employing a lost motion connection wraps additional lengths of ribbon into a lock groove in each head member to join the components together in an integral roll.

3,666,590

METHOD FOR MANUFACTURE OF CORRUGATED SYNTHETIC RESIN SHEETS

Rinnosuke Susuki, Tokyo, Hiroshi Hoshi, Narashino, and Shinichi Araki, Funabashi, Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1970, Ser. No. 10,797
Claims priority, application Japan, Feb. 14, 1969, 44/11,163
Int. Cl. B31f *1/24*
U.S. Cl. 156—210 **22 Claims**



A method for manufacture of corrugated synthetic resin sheets made of ordinary synthetic resins, but specially

suited for manufacture of corrugated synthetic resin sheets which are developed by the same inventor and have both properties of paper and synthetic resins. The sheet is corrugated while it is advanced so that ridges and hollows of the corrugation are formed in parallel with the direction of advancement of the sheet; and a plurality of straight backing members are extended in parallel with the direction of advancement of the sheet so that they may be placed in the hollows of the corrugated sheet, whereby when a planar sheet or sheets are bonded to one or both sides of the corrugated sheet by thermal welding or by use of an adhesive agent, the planar sheet or sheets may be pressed firmly against the corrugated sheet, thereby sufficiently improving the adhesiveness and mechanical strengths and rendering corrugated synthetic resin sheets capable of sufficiently absorbing the impact in an effective manner.

Representative figure: FIG. 1.

3,666,591

METHOD OF BONDING A RESINOUS FILM TO A SUBSTRATE USING HIGH ENERGY RADIATION

Roger P. Hall, Mayfield Heights, Ohio, assignor to SCM Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 682,140, Nov. 13, 1967, and Ser. No. 737,576, June 17, 1968. This application Oct. 3, 1968, Ser. No. 764,916

Int. Cl. B29c *19/02*

U.S. Cl. 156—272 **18 Claims**

A process for coating by radiation a substrate, and especially one having a metallic surface, with a substantially catalyst-free system containing a polymerizable organic unsaturated resin susceptible to free-radical catalysis; and the resulting product. In one form, a film of the resin is superimposed upon the substrate while a facing side of either the resinous film or substrate is contacted at any time prior to such radiation with an acid polymer-forming material having a mineral acid group selected from the class consisting of oxygenated sulfur-containing and oxygenated phosphorus-containing groups which are attractive to the substrate, and an organic unsaturated moiety which is sufficiently responsive to high energy radiation to react chemically with the film of the coating resin. Thereafter, the film and substrate are subjected to the high energy radiation to adhere one to the other.

The process is also adapted for coating articles with normally air-inhibited, thermosetting resins by a two-step process, wherein the resin film is first passed through one treating zone effective to impart mass integrity and thereby define a sheet, and the sheet together with the acid polymer-forming material and the substrate is then passed through another treating zone effective substantially to complete the cure of the resin and simultaneously adhere the sheet to the substrate, at least one of the treating zones comprising exposure to high energy radiation.

3,666,592

METHOD FOR AUTOMATICALLY LAYING UP PLYWOOD PANELS

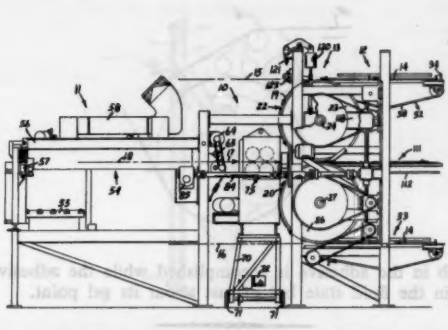
Harold A. Keller and Patrick J. Young, Lewiston, Idaho, assignors to Potlatch Forests, Inc., Lewiston, Idaho

Filed Apr. 9, 1969, Ser. No. 814,581

Int. Cl. B27d *1/04*

U.S. Cl. 156—285 **4 Claims**

A method for automatically laying up plywood panels, particularly three ply, is described in which the front and back veneer sheets are fed crosswise to respective parallel vacuum drum assemblies that are rotated in opposite directions. The drums bend the sheets about the peripheries thereof and move the sheets in a 180° path to converge between the drum assemblies. A core sheet is fed between the drum assemblies to interpose between the front and



back sheets. The front, core and back sheets are fed in a timed relation to align the leading edges of the sheets as they converge.

3,666,593

PROCESS FOR MAKING A POLYISOCYANATE-IMPREGNATED, PAPER-OVERLAID PANEL

Hong Man Lee, Danbury, Conn., assignor to U.S. Plywood-Champion Papers Inc., New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,532

Int. Cl. B29c *3/00*; C09j *5/02*

U.S. Cl. 156—285 **14 Claims**

An organic polyisocyanate serves as both the impregnant and the adhesive for paper-overlaid panels. Such panels can be used for indoor and outdoor applications and especially for making concrete forms. The polyisocyanates used have a low molecular weight and can be used with or without catalysts and in solution with an inert solvent. The properties of the polyisocyanates used make it possible to combine impregnation and lamination of the overlay paper in one step as long as substantially closed conditions are used. The polyisocyanate reacting with water in the paper and substrate (especially when wood) forms carbon dioxide, the pressure of which when confined by the press will force and distribute the polyisocyanate into the substrate and paper.

Where the substrate to be overlaid is plywood, the same may be formed at the same time as the overlay is placed. The overlay paper may be kraft paper of any grade.

3,666,594

PROCESS FOR PREPARATION OF NONWOVEN FIBROUS WEB-TISSUE LAMINATE

Eugene H. Condon and James E. Robinson, Neenah, and James H. Wills, Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

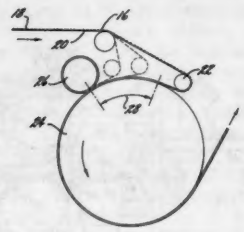
Filed Mar. 30, 1970, Ser. No. 23,824

Int. Cl. B32b *7/14*

U.S. Cl. 156—291 **9 Claims**

Tissue-fiber laminates are prepared by substantially completely embedding a nonwoven fibrous web in a pat-

terned layer of a plastisol adhesive which is partially embedded in the tissue web. Embedment of the fibrous



web in the adhesive is accomplished while the adhesive is in the fluid state but at just about its gel point.

3,666,595

METHOD FOR MANUFACTURE OF COMPACTED COMPOSITE FABRICS USING THERMOPLASTIC ADHESIVES

Jackson Bauer, Croydon, Pa., assignor to Collins and Aikman Corporation, New York, N.Y.

Filed Oct. 6, 1969, Ser. No. 863,966
Int. Cl. C09j 5/00
U.S. Cl. 156—324 9 Claims

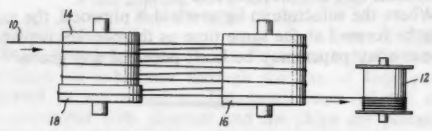
Composite textile fabrics which are dimensionally stabilized to laundering and dry cleaning and a method for producing same are provided. In the process of the present invention, an uncompacted laminate is formed from at least one ply of a textile fabric, and one or more plies of either a textile fabric or a non-textile material such as a foam. The plies are bonded together with a hot melt adhesive which has a softening point above 160° F. and which is flowable and adhesive in a temperature range above 160° F. and below the softening or decomposition temperature of the materials comprising the plies. The laminate is then heated to the above temperature range and compacted an amount sufficient to compensate for at least a substantial portion of the inherent shrinkage of the uncompacted laminate. The compacted laminate is then cooled while in the compacted form. The hot melt adhesive solidifies and holds the composite textile fabric in the compacted dimensionally stabilized form.

3,666,596

METHOD FOR IMPROVING STRIPPABILITY OF INSULATION FROM WIRE

Charles G. Morton, Chelmsford, Mass., assignor to General Electric Company

Filed July 1, 1970, Ser. No. 51,534
Int. Cl. H02g 1/12; B32b 35/00
U.S. Cl. 156—344 4 Claims



In order to improve the strippability of insulation from wire, the insulated wire is wound taut over two spaced-apart capstan wheels. One capstan wheel is provided with an annular section of enlarged diameter, and the last turn of the wire on its travel to the take-up reel is passed over this annular section. The conductor and insulation are stretched thereby substantially loosening or breaking the bond between the insulation and conductor, and the insulation then may be readily stripped from the wire.

3,666,597

METHOD OF CATALYZING ADHESIVE CURE

Willis E. Parnell, Oak Grove, Oreg., assignor of fractional part interest to Howard Carl Mason, Oregon City, Oreg.

No Drawing. Filed Aug. 29, 1967, Ser. No. 663,941
Int. Cl. C09j 5/04
U.S. Cl. 156—305 9 Claims

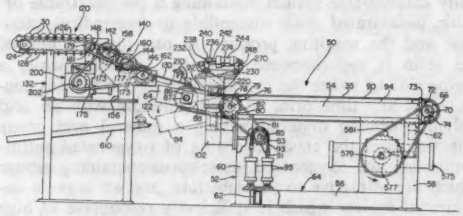
A procedure for bonding elements together, wherein the elements are assembled with a glue line between them, and the glue line comprises an adhesive and a catalyst for accelerating curing of the adhesive distributed in encapsulated form in the adhesive. Also distributed in the glue line is a somwhat less active nonencapsulated catalyst for the adhesive. After the elements have been assembled, the encapsulated catalyst is released by opening up the capsules to promote fast curing of the adhesive in localized regions distributed throughout the glue line, with final curing of the adhesive throughout the entire glue line being promoted also by the nonecapsulated catalyst.

3,666,598

APPARATUS FOR MAKING A ROLLING LOBE DIAPHRAGM

Christopher E. Christie, James R. Fedor, and Ishmael S. Harwell, Akron, and Robert S. Riggs, Stow, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 13, 1970, Ser. No. 54,420
Int. Cl. B65h 11/02, 25/32, 81/04
U.S. Cl. 156—361 22 Claims



Method of building an automotive vehicle type shock absorber sleeve having reinforcing cord elements in superimposed coaxial helices placed between a seamless rubbery sleeve and a covering layer of rubbery material. An apparatus for performing the method described which features a plurality of curing mandrels successively disposed to cooperate individually with a broad endless belt to wind successive layers of reinforcing cords and rubbery material about seamless tubes placed axially on each mandrel, and tower mechanisms for measuring, cutting to length, and disposing on the belt individual pieces of cord stock at appropriate angular relation with the mandrel length and belt movement directions.

3,666,599

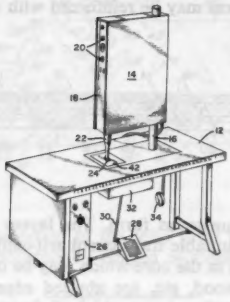
SONIC OR ULTRASONIC SEAMING APPARATUS

Edward G. Obeda, Brookfield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Nov. 27, 1970, Ser. No. 93,151
Int. Cl. B29c 27/08; B23k 1/06
U.S. Cl. 156—380 16 Claims

A sonic or ultrasonic seaming apparatus uses a driven rotating anvil and an opposing resonator also called "horn" which is coupled to a source of sonic or ultrasonic energy. The speed of the driven anvil, and consequent workpiece feed rate, is coordinated with the velocity of the frontal surface of the resonator imparting the

sonic or ultrasonic energy to the workpiece. This is accomplished by an electronic circuit in which the applied



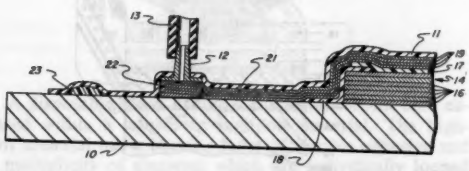
voltages to the power supply and to the motor for the anvil assume a predetermined relationship.

3,666,600

APPARATUS FOR FORMING LAYUP LAMINATE

Stanley Y. Yoshino, Monterey Park, Calif., assignor to North American Rockwell Corporation

Filed Mar. 10, 1969, Ser. No. 805,595
Int. Cl. B32b *31/00*
U.S. Cl. 156—382 **3 Claims**



A technique is described for preparing glass fabric laminates bonded with polyaromatic resins such as polyimide. A vacuum bag layup arrangement having polyimide prepregs covered with a porous release layer and a layer of bleeder fabric having a substantial void volume is provided for accommodating a flow of solvent and resin from the prepregs. An impervious border around the layup prevents edge bleeding of the resin. Special paths to the vacuum connections are provided from the bleeder layer. A two stage pressurized curing cycle is also provided so that properties of the composite laminate are controlled and low processing costs are encountered.

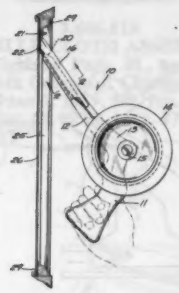
3,666,601

TAPE APPLICATOR

Ben W. Wuerch, 4203 N. 62nd St., Milwaukee, Wis. 53203

Filed Aug. 26, 1970, Ser. No. 67,013
Int. Cl. B32b *31/18, 31/20*
U.S. Cl. 156—527 **7 Claims**

This tape applicator is primarily intended for applying masking tape to window glass panes, along sash muntins, preparatory to painting the muntins. The applicator comprises a tape roll support, a guide along which is trained tape unrolled from the tape roll, a tape presser at the end of the guide and a knife at the end of the guide for severing the tape after a tape strip has been applied to the glass. The guide has a transversely curved bed narrower



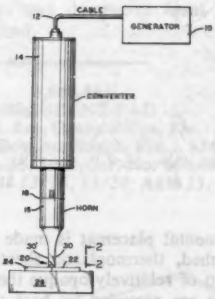
than the presser, and has a curvilinear dimension at least equal to the tape width.

3,666,602

APPARATUS FOR JOINING THERMOPLASTIC MEMBERS BY SONIC OR ULTRASONIC ENERGY

Edward G. Obeda, Brookfield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Original application Mar. 7, 1969, Ser. No. 805,206, now Patent No. 3,577,292, dated May 4, 1971. Divided and this application Mar. 25, 1970, Ser. No. 25,618
Int. Cl. B29c *27/08*; B32b *31/16*
U.S. Cl. 156—580 **5 Claims**



Juxtaposed thermoplastic members abutting along a common interface surface are joined by contacting both members with a sonically or ultrasonically vibrating horn having tooth-like protrusions at its output end. The protrusions are caused to penetrate through the surface of each member and, responsive to the dissipation of energy, cause softened material which is urged to flow across the interface surface to provide, upon hardening, a joint.

3,666,603

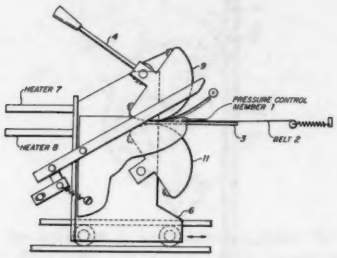
APPARATUS FOR LAMINATING PRE-EMBOSSED I.D. CARDS

Roger J. Kuhns, Lincoln, and Bruce H. MacLeod, Littleton, Mass., assignors to Avant Incorporated, Lincoln, Mass.

Filed Apr. 28, 1970, Ser. No. 32,541
Int. Cl. B30b *15/34*; B32b *31/20*
U.S. Cl. 156—583 **10 Claims**

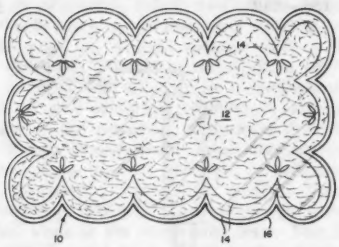
Apparatus for applying laminating pressure to heated sheets to be laminated having embossed indicia within a first area of the sheets and the absence of embossed indicia within a second area of the sheets, including a

pressure applicator means for applying laminating pressure to the heated sheets solely within the second area thereof, the pressure applicator means including a pressure



control member having a cutout portion overlaying the embossed indicia to prevent the application of laminating pressure and heat thereto, in order to enable pre-embossing of the sheets prior to lamination.

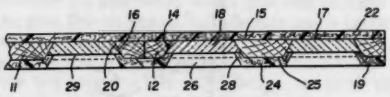
3,666,604
ORNAMENTAL ARTICLE AND METHOD OF MAKING THE SAME
Dennie Coffet, 1 W. 67th St., New York, N.Y. 10023
Filed Nov. 1, 1968, Ser. No. 772,650
Int. Cl. B44b *1/06*; B32b *5/24*
U.S. Cl. 161—2 **38 Claims**



An ornamental placemat is made of top and bottom, highly polished, thermoplastic sheets between which is placed a batt of relatively opaque thermoplastic wadding. Design lines are provided by heat sealing the sheets to the wadding, which becomes compressed and fused into a transparent mass laminated to the sheets. The resulting article is relatively opaque except along the design lines which are transparent and have an unusual highly luminous appearance. The sheets and/or the wadding may be tinted to enhance the decorative quality of the article. In a second embodiment, similar effects are obtained while omitting the bottom transparent sheet. In another embodiment, the surface of the wadding is partially embedded in the transparent top sheet.

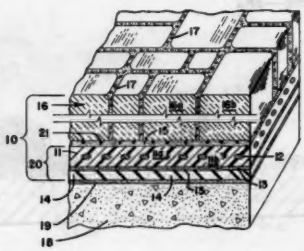
3,666,605
LAMINATED PANEL WITH AN INTEGRAL WINDOW, AND METHOD OF FABRICATION THEREOF
Walter H. Meyer, Huntington Station, and William M. Menger, Babylon, N.Y., assignors to Lunn Laminates, Inc., Wyandanch, N.Y.
Filed July 23, 1970, Ser. No. 57,555
Int. Cl. E04c *1/42, 2/54*
U.S. Cl. 161—3.5 **5 Claims**

A laminated panel has a translucent, protective plastic layer onto which is bonded one or more blocks to form a core. At least one of the blocks has a hole therethrough into which is set a transparent pane which thereby bonds to the layer. Another plastic layer is bonded to the other side of the core. Before bonding, the layers may be in the form of a translucent thermoplastic sheet or in a translucent thermosetting plastic liquid such as a resin coating and in either form may be reinforced with a fibrous sheet



in a woven or unwoven form. The layers are bonded to the block by a suitable transparent self-setting resin adhesive. The blocks in the core which may be of plastic foam, aluminum, plywood, etc. are abutted edgewise and covered by the seamless layer which if desired may have a pigment for concealing the blocks.

3,666,606
COMPOSITE MEMBRANE AND TILE SYSTEM
William S. Stokes, 941 Placentia Ave., Apt. F, Fullerton, Calif. 92634
Filed Feb. 18, 1970, Ser. No. 12,182
Int. Cl. B32b *3/16*
U.S. Cl. 161—37 **14 Claims**

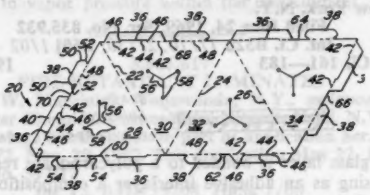


A composite membrane and tile system, comprising an intermediate sheet of fluid impervious, synthetic polymer resin, an oriented rubber elastomeric layer adhesively bonded to the bottom of the sheet, and a layer of tile disposed atop the sheet. A grout, preferably comprising a flexible epoxy resin with an aluminum silicate extender, separates segments of the tile. The tile may be bonded to the sheet by an acrylonitrile and phenolic resin adhesive. The system facilitates installation of tile directly on architectural substrates, the membrane portion preventing fluid leakage to, and isolating the tile from movement of, the substrate.

3,666,607
BLANK FOR CONSTRUCTING SOLID FORMS
Joel J. Weissman, 169 Marietta Ave., Passaic, N.J. 07055
Filed Sept. 3, 1968, Ser. No. 756,774
Int. Cl. B31d *5/00*
U.S. Cl. 161—44 **9 Claims**

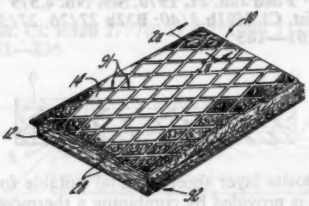
A blank for constructing solid forms. The blank comprises a stiff planar sheet. The sheet has at least one polygonally shaped section. Each of the sections has a plurality of slits in accordance with the number of corners of the polygon. Each of the slits emanates from the center of a polygonal section and extends outwardly towards one of the corners of the sections. The other ends of the

slits are terminated at a circular opening. The blank has fastening elements on each of its free edges which are adapted to facilitate construction of a solid form. The slits



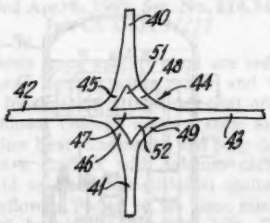
enable the securement of the solid form to another solid form having polygonally shaped sections with similarly formed slits.

3,666,608
DISPOSABLE TOWEL
William J. Mattes, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 11, 1970, Ser. No. 10,578
Int. Cl. B32b *5/00;* **D04h** *13/00*
U.S. Cl. 161—62 **8 Claims**



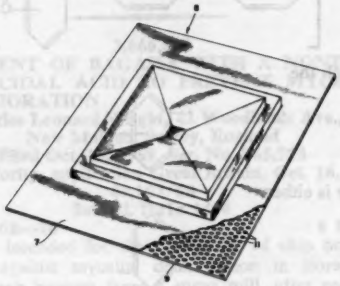
A disposable towel having a central absorbent core encased within a nonwoven high-loft material. The high-loft material has a backing layer of flexible adhesive and a multiplicity of elements which are individually looped outward from said backing layer with the ends of each loop embedded in the backing layer.

3,666,609
RETICULATE SHEET MATERIAL
Frank Kalwaites, Somerville, and Peter L. Doviak, South Brunswick, N.J., assignors to Johnson & Johnson
Filed July 15, 1970, Ser. No. 54,961
Int. Cl. B32b *3/10*
U.S. Cl. 161—109 **15 Claims**



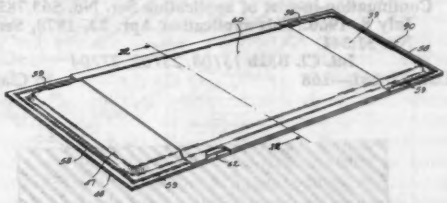
A reticulate polymer sheet material comprising intersecting filaments with the filaments integral at the intersections. The filaments between intersections have a high degree of molecular orientation. The intersections have a molecular orientation of at least 75% of the molecular orientation of the filaments.

3,666,610
GRILLE CLOTH ASSEMBLY
Sol A. Rosen, Highland Park, Ill., assignor to Assembly Cloth Company, Chicago, Ill.
Filed June 3, 1969, Ser. No. 829,904
Int. Cl. B32b *3/10, 3/26*
U.S. Cl. 161—113 **2 Claims**



A three dimensional acoustical grille cloth assembly is described comprising a shape retaining backing sheet with a decorative grille cloth front portion bonded thereto. A preferred method of forming the three dimensional grille cloth assembly by hot pressing a laminated thermoplastic backing sheet and decorative front grille cloth portion is also described.

3,666,611
ABSORBENT PAD
Curt G. Joa, Ocean Ridge, Fla.
(Box 1121, Boynton Beach, Fla. 33435)
Filed Aug. 15, 1969, Ser. No. 850,482
Int. Cl. A61f *13/16, 13/20;* **A61l** *15/00*
U.S. Cl. 161—147 **4 Claims**



Absorbent pad having a pulp filler, wadding envelope, and body contacting cover outside the envelope which is shorter than the pad is long, thus to leave end margins of the pad uncovered. The apparatus and method for fabricating such a pad involves superimposing separate pulp mats, one of which is compressed before superimposition in order that the compressed mat functions as a flow distribution ply, subdividing the superimposed mats into discrete pad fillers with gaps therebetween, encasing the spaced pad fillers in a wadding envelope which is continuous across the gaps, cross sealing the envelope across the gaps to form a continuous wadding envelope tube with links interconnecting the spaced filler pads, and applying the body contacting cover sheet thereto.

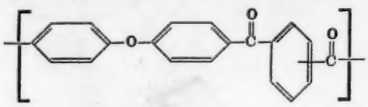
3,666,612

HEAT-SEALABLE COPOLYKETONE FILM STRUCTURE

Rudolph J. Angelo, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 10, 1970, Ser. No. 45,236
Int. Cl. B32b 27/08
U.S. Cl. 161—165 7 Claims

A heat-sealable copolyketone film structure is provided which consists of a crystalline layer of stratum and an amorphous layer or stratum, each stratum having the composition



in which the

moiety is either

(T moiety) or

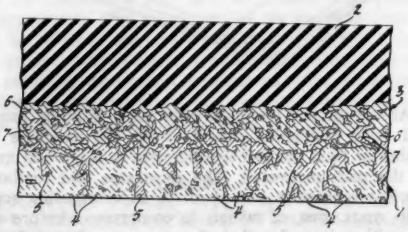
(I moiety), and the T:I ratio varies from 90:10 to 50:50 for the crystalline stratum, and from 90:90 to 0:100 for the amorphous stratum, provided that the T:I ratio of the amorphous stratum is no greater than the T:I ratio of the crystalline stratum; the above film structure is useful as a packaging film.

3,666,613

COMPOSITE CERAMIC-ORGANIC MATERIAL AND METHOD FOR MAKING SAME

Duane H. Beninga, Arvada, Colo., assignor to Coors Porcelain Company, Golden, Colo.

Continuation-in-part of application Ser. No. 563,785, July 8, 1966. This application Apr. 23, 1970, Ser. No. 31,341
Int. Cl. B32b 15/08, 25/02, 27/04
U.S. Cl. 161—168 15 Claims



In accordance with this invention there is provided an improved tough and wear resistant composite of hard ceramic bonded to rubber or other organic resin by means of a metalized layer on the ceramic which is bonded to the ceramic and to which the organic resin forms a bond thereby to greatly increase the bond strength between the ceramic and the resin.

3,666,614

GLASS-POLYCARBONATE RESIN LAMINATES

Robert Howard Snedeker, Piscataway, Kenneth Thomas Garty, Somerville, and Frank Joseph Skiermont, Bound Brook, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 24, 1969, Ser. No. 835,932
Int. Cl. B32b 17/10, 27/30; B60j 1/02
U.S. Cl. 161—183 19 Claims

A glass layer is bonded to a polycarbonate resin layer by using as an adhesive interlayer a composition which essentially consists of ethylene-vinyl acetate copolymer. Preferably, an organo-silicon compound is used as an adhesion promoting agent and is applied either as a primer on one or more of the lamina to be bonded to each other, or as an additive in the above-mentioned copolymer adhesive composition.

The laminated assemblies, produced as described above, may be used as structural windshields in motor vehicles.

3,666,615

COMPOSITE LAYER SHEET MATERIAL

Toshiharu Iwai and Kazukiyo Yamazaki, Fukui-shi, Japan, assignors to Nitto Denki Kogyo Kabushiki Kaisha (also known as Nitto Electric Industrial Co., Ltd.), Osaka-fu, Japan

Filed Jan. 21, 1970, Ser. No. 4,579
Int. Cl. H01b 3/40; B32b 27/26, 27/38
U.S. Cl. 161—185 8 Claims

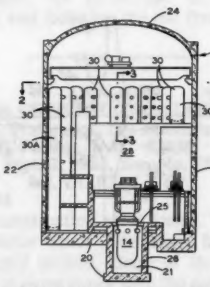
A composite layer sheet material suitable for electrical insulation is provided by combining a thermosetting resin layer and a hardening agent layer, the hardening agent being capable of hardening the thermosetting resin layer. The two above layers are separated by a contact-preventive film layer which melts on heating and allows the thermosetting resin layer and hardening layer to react. A fiber base is embedded in either the thermosetting resin layer or hardening agent layer to provide structural support for the composite.

3,666,616

VAPOR SUPPRESSING MEANS FOR A NUCLEAR REACTOR

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jan. 7, 1970, Ser. No. 1,166
Int. Cl. G21c 9/00
U.S. Cl. 176—38 10 Claims



Apparatus for suppressing vapor pressure buildup within a nuclear reactor containment including a storage tank

having a quantity of fluid stored therein and provided with a rupture disk and associated apparatus for explosively activating a disk rupturing element to release the fluid from the tank and into the containment in response to a buildup in vapor pressure within the containment.

3,666,617

FIRE RETARDANT LAMINATES

Harry W. Marciniak, Tonawanda, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 686,772, Nov. 29, 1967. This application May 22, 1970, Ser. No. 39,917

Int. Cl. B32b *15/08;* H05k *1/00*

U.S. Cl. 161—186 14 Claims

A fire retardant, non-blistering laminate is produced by impregnating the uppermost ply of a multi-ply laminate with a resin in which the fire retardant additive is absent. If fire retardant requirements permit, one or more additional plies can be additive-free in order to provide improved strength, economy or for other purposes.

3,666,618

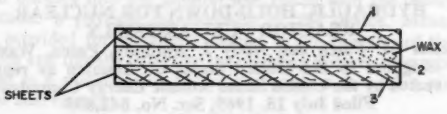
LAMINATE BONDED WITH AN ADHESIVE WAXY TELOMER OF ETHYLENE ON PSEUDOCUMENE

Ernest P. Block, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Original application Apr. 12, 1968, Ser. No. 720,832. Divided and this application Oct. 7, 1970, Ser. No. 78,942

Int. Cl. B32b *27/10, 27/32;* C09j *3/14*

U.S. Cl. 161—235 4 Claims



Laminating wax of high adhesive characteristics especially useful in the production of intercalated products is obtained from telomer resulting from a telomerization employing pseudocumene as the telegen and ethylene as the taxogen, the reaction producing said telomer being hereinafter referred to as the telomerization of ethylene on pseudocumene.

3,666,619

KRAFT PULP AND PAPER RECOVERY PROCESS

Joseph E. Mailhos and Gerald P. Delaune, Elizabeth, La., assignors to Calcasieu Paper Company, Inc., Elizabeth, La.

Filed Apr. 8, 1969, Ser. No. 814,343

Int. Cl. D21c *11/12*

U.S. Cl. 162—30 12 Claims

Waste effluents from a kraft plant are reduced by reclaiming colored liquors, white water and weak liquor sewer waters by separate procedures that are preferably integrated. Effluent colored liquors, such as evaporator condensate, blow heat condensate, and pulp decker filtrate are treated in a clarifier with calcium carbonate as a flocculating aid to settle out colloidal material and the clarifier underflow is passed to the lime mud filter cake for subsequent burning in the lime kiln. The clarified liquor is returned to the process for use as scrub waters in a recovery furnace gas scrubber and in the primary and secondary lime kiln gas scrubbers, and the underflow from the primary scrubber is used as a source of calcium carbonate in the clarifier. The white water is isolated from the plant sewer system and also treated in a clarifier with calcium carbonate. In this case, the underflow from the secondary scrubber serves as a calcium carbonate source. The clarified white water is then filtered and subsequently passed through a cation exchange unit so that it can be then used as fresh water in the kraft plant. Weak liquor from the plant sewer system is also isolated and after collection in a pond is returned as wash water to an intermediate stage in the multistage pulp washing unit. A portion of the effluent from the cation exchange unit is heated in a blow heat recovery unit and subsequently used as fresh wash water in the last stage of the washing unit while the underflow from the recovery furnace gas scrubber is used as wash water in the lime mud washer.

3,666,620

TREATMENT OF BAGASSE WITH A NONTOXIC FUNGICIDAL ACID TO PREVENT MYCELIAL DETERIORATION

Charles Leonard Wright, 42 Woodlands Ave., New Malden, Surrey, England

Filed Oct. 13, 1969, Ser. No. 865,713

Claims priority, application Great Britain, Oct. 16, 1968, 49,162/68

Int. Cl. D21c *1/04*

U.S. Cl. 162—76 8 Claims

Bagasse intended for the production of chip board is stabilised against mycelial deterioration in storage by treating fresh bagasse from a sugar mill, after reducing the moisture content to below 50% of the weight thereof, with a nontoxic fungicidal acid in the liquid phase in an amount which reduces the pH of the treated material to 4.5 or below, preferably 3.5 to 4.5. The preferred acids are formic, acetic and propionic acids.

3,666,621

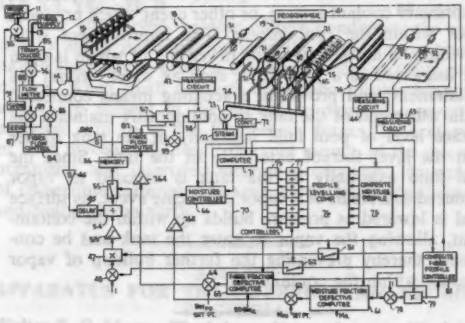
PROCESS AND APPARATUS FOR MOISTURE AND FIBER CONTENT CONTROL IN A PAPERMAKING MACHINE

William L. Adams, Dublin, Ohio, assignor to Industrial Nucleonics Corporation

Filed Feb. 16, 1968, Ser. No. 706,161

Int. Cl. D21f *5/06*

U.S. Cl. 162—198 40 Claims



Disclosed are a system for and method of controlling processes of paper sheet manufacture. In response to basis weight signals at the process wet and dry ends, as well as a moisture signal from the dry end, a proportionality constant indicative of the sheet fiber fraction at the wet end is computed. The proportionality constant is repeatedly recomputed once every twenty minutes and is stored between recomputations. The proportionality constant is combined with a wet end basis weight output derived at

a later time than the above signals to indicate fiber content at the dry end and control fiber flowing into the paper making headbox. Control of fiber flow into the headbox and moisture removed by the drying sections is respectively in response to indications of the amount of fiber and moisture at the dry end being less than defective limits. The dryers are controlled by wet end moisture and dry end composite profile moisture. The dryers are controlled so that the inherent lag of steam units therein is compensated by heat supplied by trim dryers, having fast response times. To derive instantaneous values of average wet end basis weight, the wet end gauge is normally single pointed and only periodically scanned across the sheet.

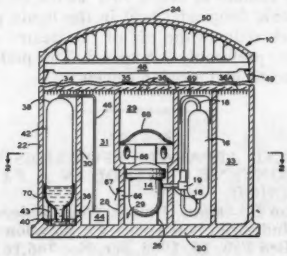
ERRATUM

For Class 176—38 see:
Patent No. 3,666,616

3,666,622
NUCLEAR REACTOR VAPOR SUPPRESSING MEANS

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 13, 1969, Ser. No. 824,044
Int. Cl. G21c *9/00*
U.S. Cl. 176—38 **8 Claims**



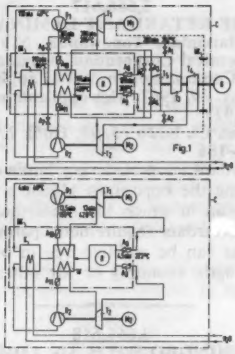
An improvement in apparatus for suppressing vapor pressure buildup within a nuclear reactor containment due to an accident in a reactor system, such as a rupture of the primary coolant system, or other event which produces vapor within the containment. The improvement is in providing an upright tank, the lower end of which is open and immersed in a pool fluid, such as water, within the containment; and providing evacuating means connected to the other end of the tank to continuously maintain the surface level of pool fluid internally of the tank higher than the level thereof externally of the tank. Since the pool fluid externally of the tank is exposed to vapor produced as a result of a vapor producing event, its surface level is lowered as pressure builds up within the containment, allowing the vapor to enter the tank and be condensed, thereby preventing the further buildup of vapor pressure within the containment.

3,666,623
GAS TURBINE INSTALLATION FOR NUCLEAR POWER PLANT

Elmar Harand and Hans-Peter Schabert, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 23, 1968, Ser. No. 755,008
Claims priority, application Germany, Aug. 26, 1967, P 16 01 656.1
Int. Cl. G21c *15/18*
U.S. Cl. 176—60 **12 Claims**

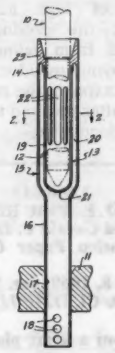
Gas turbine installation for operating with a gas having characteristics deviating considerably from those of an ideal gas, particularly for a nuclear power plant with gas-cooled reactor, includes compressor means normally operating at a given rotary speed so as to provide a given flow-through rate of the gas at a given pressure, and means utilizing released after-heat power for providing emergency or after-cooling subsequent to cut-off of the heat source or of the reactor by considerably increasing the rotary speed of the compressor means so as to provide an increased flow-through rate of the gas at a considerably reduced pressure approximating an ideal gas.



3,666,624
HYDRAULIC HOLD-DOWN FOR NUCLEAR REACTOR FUEL ASSEMBLY

Lester M. Finch and Andy J. Anthony, Pasco, Wash., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed July 18, 1969, Ser. No. 842,898
Int. Cl. G21c *15/22*
U.S. Cl. 176—64 **1 Claim**



An assembly for use in a nuclear reactor includes a fuel assembly having a nose piece at its lower end and a support receptacle having a socket which receives the nose piece. Openings in the nose piece and socket conduct coolant into the nose piece perpendicular to the longitudinal axis of the fuel assembly. Leakage flow vents extend the length of the nose piece communicating with the interior of the socket below the nose piece and the exterior of the fuel assembly above the top of the receptacle to reduce the lifting effect of the coolant on the fuel assembly.

3,666,625

DEVICE FOR DETECTION AND LOCATION OF FAILED NUCLEAR FUEL ELEMENTS

Sigurd A. Nybo, Penn Hills, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1969, Ser. No. 885,407
Int. Cl. E21b 21/04; E21c 7/00
U.S. Cl. 176—68 8 Claims

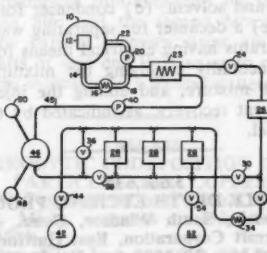
Apparatus for testing for nuclear fuel element cladding failures comprising a device such as a magnetic member suspended within the gas plenum of a clad nuclear fuel element. When a cladding failure occurs, water or ambient fluid diffuses into the plenum and reacts with the device to cause a physical displacement of the device. Means are provided for locating a change in the position of the device and thereby detecting the cladding failure. Also provided is a material for absorbing moisture in a clad nuclear fuel element.

3,666,626

METHOD AND MEANS FOR REVERSIBLY CHANGING THE BORIC ACID CONCENTRATION IN THE COOLANT OF A NUCLEAR REACTOR

Gottfried Gramer, Furth, and Gunter Wittrowsky, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 17, 1969, Ser. No. 791,893
Claims priority, application Germany, Jan. 23, 1968, S 113,825
Int. Cl. G21c 7/00
U.S. Cl. 176—86 7 Claims



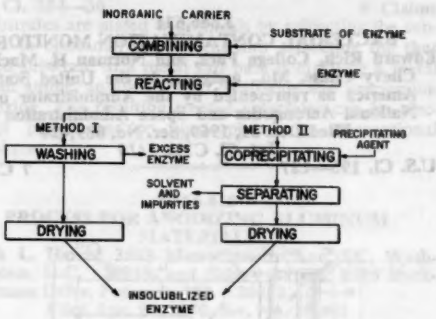
A method and means whereby the boric acid concentration in the primary coolant of the nuclear reactor may be reversibly changed in order to compensate for excess reactivity and to enhance load follow capability. The primary coolant, or a portion thereof, may be passed through an anion exchange bed containing a basic resin. The temperature of the influent to the bed is varied such that the coolant receives additional boric acid at higher temperatures and loses boric acid at lower temperatures.

3,666,627

METHOD OF STABILIZING ENZYMES

Ralph A. Messing, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 14, 1968, Ser. No. 767,116
Int. Cl. C07g 7/02
U.S. Cl. 195—68 4 Claims



This invention relates to an improved method of stabilizing enzymes by bonding the enzymes to inorganic carriers in the presence of their substrates whereby the enzymes become insolubilized; and the product formed by the method.

3,666,628

PROCESS FOR GROWING MICROORGANISMS

Robert G. Dworschack and William R. Lamm, Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 705,231, Feb. 13, 1968. This application Mar. 19, 1971, Ser. No. 126,289
Int. Cl. C12d 13/10; C12b 1/20
U.S. Cl. 195—80 R 10 Claims

Under submerged, aerobic culture conditions, the mycelia of many microorganisms of the Streptomyces genus have a tendency to grow in the form of compact spherical masses. When small amounts of aqueous dispersible materials are present in the growth medium, the mycelia produced will be of the filamentous form. The presence of such mycelia will result in rapid growth of the microorganisms and improved enzyme production. Examples of dispersible materials are agar, carboxymethylcellulose, and diatomaceous earth.

3,666,629

APPARATUS FOR TRANSFERRING ANAEROBIC BACTERIA

Walter E. C. Moore, Blacksburg, Va., assignor to Virginia Polytechnic Institute Educational Foundation, Blacksburg, Va.

Filed June 18, 1970, Ser. No. 47,480
Int. Cl. C12b 1/02
U.S. Cl. 195—127 7 Claims

An apparatus for transfer of anaerobic bacteria under oxygen-free conditions having at least one pivotally mounted discharge for discharge of an oxygen-free gas downwardly toward a tube support and a discharge for discharge of measured quantities of anaerobic bacteria toward the tube support. The gas discharge can be pivoted to a remote position.

3,666,630

PRODUCTION OF TREMORTINS A, B, AND C

Alex Ciegler and Ching Tsang Hou, Peoria, Ill., assignors to the United States of America as represented by the Secretary of Agriculture

Filed May 4, 1970, Ser. No. 34,390
Int. Cl. C12d 7/00
U.S. Cl. 195—81 2 Claims

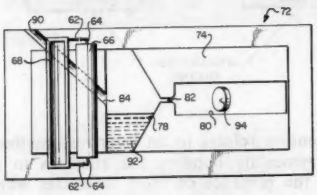
Tremortins A, B, and C are produced in high yield by culturing certain fungi, namely, *Penicillium palitans, P. crustosum, P. granulatum, P. cyclopium, P. puberulum, P. olivino-viride,* or *P. martensii.*

3,666,631

BACTERIAL CONTAMINATION MONITOR

Edward Rich, College Park, and Norman H. MacLeod, Chevy Chase, Md., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1969, Ser. No. 889,420
Int. Cl. C12k 1/10
U.S. Cl. 195—127 7 Claims



A portable testing instrument for determining the level of bacterial and other microbial (algal, protozoal, etc.) contamination within a monitored sample without the need for external electric recording devices or external power source. The invention utilizes an adenosine tri-phosphate (ATP) light reaction, the intensity of which is directly proportional to the presence of the ATP. High-speed film is used for time displaying the low level of biochemical light produced, the light exposure intensity being compared to a calibrated scale for determination of the bacterial contamination level. Additionally, the instrument incorporates a novel disposable packaging concept for storing and producing the biochemical reaction.

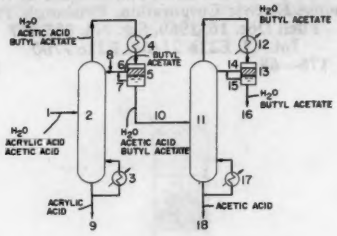
3,666,632

METHOD FOR THE SEPARATION OF ACRYLIC ACID FROM AQUEOUS SOLUTION CONTAINING ACRYLIC ACID AND ACETIC ACID

Makoto Honda, Tokyo, Yasuhiro Kubota, Yokohama-shi, Atsushi Aoshima and Tokuichi Hisamatsu, Kawasaki-shi, and Minoru Ueda, Yokohama-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1969, Ser. No. 863,248
Claims priority, application Japan, Oct. 8, 1968, 43/72,825; Nov. 9, 1968, 43/81,729; Nov. 14, 1968, 43/82,876
Int. Cl. B01d 3/36; C07c 57/04
U.S. Cl. 203—56 8 Claims

In the process for separating acrylic acid from aqueous solution containing acrylic acid and acetic acid, the improvement which comprises subjecting the said aqueous solution to an azeotropic distillation in the presence of at least one member selected from the group consisting of butyl acetate, ethyl butyrate, ethyl isobutyrate, ethyl methacrylate, propyl acrylate and propyl propionate as an entrainer, distilling off acetic acid and water



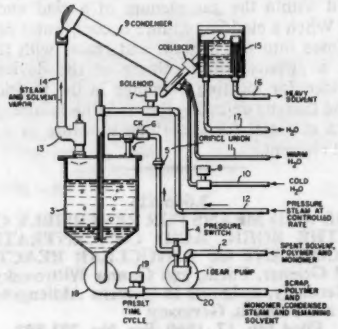
from the column head and separating acrylic acid from the column bottom.

3,666,633

RECOVERY OF CHLORINATED ALKANE SOLVENT

Andrew Michael Essex, Bridge City, Tex., and Robert Bernard Heiart, Middletown, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1969, Ser. No. 871,970
Int. Cl. B01d 1/14, 3/00, 3/34
U.S. Cl. 203—95 7 Claims



An apparatus for recovery of organic solvents at least partially immiscible with water from mixtures, the apparatus having (a) a vessel free from heating surfaces, (b) means for supplying steam into the vessel, (c) exit means for the steam and solvent, (d) condenser for steam and solvent, and (e) a decanter for separating water and solvent; the apparatus having electrical means for automatically and sequentially supplying the mixture, injecting steam into the mixture, and ending the injection upon maximum solvent recovery, as indicated by temperature above the vessel.

3,666,634

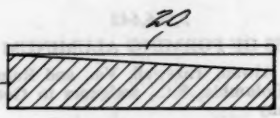
VARIABLE DEPTH ETCHING PROCESS

Eugene J. Szetela, South Windsor, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 30, 1970, Ser. No. 23,664
Int. Cl. C23b 5/48; B23p 1/00
U.S. Cl. 204—15 4 Claims

Variable depth etched channels are formed in a metal substrate. A pattern is formed on the substrate by standard photo-etching techniques, and a film of gold is deposited on the portions of the metal substrate which are not to be formed into channels. In one embodiment a

metal overlay such as nickel is electrodeposited over the entire assembly at a variable depth. The metal overlay is then chemically etched until the overlay is completely removed. Maximum depth of the etched channels will be

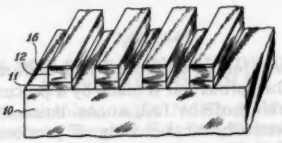


related to the maximum thickness of the overlay. In another embodiment, the substrate with the gold film is put through a deplating process which will form the channels by electroremoval of substrate material.

3,666,635
METHOD FOR FABRICATING A MEMORY STRIP ARRAY

Shintaro Oshima and Toshihiko Kobayashi, Tokyo, Tetsusaburo Kamibayashi, Niza-machi, Akira Okada and Yoshihisa Komazawa, Tokyo, and Keigo Komuro, Ebina-machi, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed Apr. 13, 1970, Ser. No. 27,680
Claims priority, application Japan, Apr. 18, 1969, 44/29,649; May 30, 1969, 44/41,660
Int. Cl. C23b *5/48*; C23f *17/00*
U.S. Cl. 204—15 **3 Claims**



A method for fabricating a memory strip array, provided with a number of parallel memory strips, on a smooth surface of an insulative substratum, which a first ferromagnetic thin film and a conductive thin film are successively deposited in a superposed relationship on the smooth surface so as to obtain a composite layer; the composite layer is then etched in a chemical photo-etching process and an electrolytic-etching process to produce parallel strips of the composite layer, the respective ends of which are jointed respectively together to end lines of the composite layer; a second ferromagnetic thin film is electroplated, by the use of the end lines as an electrode, on each of the parallel strips so as to produce the parallel memory strips each having a closed magnetic circuit around a conductive thin film-strip by the first ferromagnetic thin film and the second ferromagnetic thin film; and the parallel memory strips are separated at necessary parts of said end lines so as to obtain parallel memory strips separated in a desired pattern.

3,666,636
ELECTROLYTIC CODEPOSITION OF FINE PARTICLES WITH COPPER

Thaddeus W. Tomaszewski and Lillie C. Tomaszewski, Dearborn, Mich., assignors to Udylite Corporation, Warren, Mich.

No Drawing. Filed June 19, 1969, Ser. No. 834,891
Int. Cl. C23b *5/48, 5/20*
U.S. Cl. 204—16 **16 Claims**

Fine particles of many non-conducting materials do not codeposit readily from aqueous acidic copper electroplating baths, unless there is present in the bath aliphatic amines, especially polyamines or imines, or amino acids such as alanine or EDTA. These amino compounds are especially effective in acidic copper sulfate plating baths for the codeposition of dispersed fine, bath-insoluble, nonconducting particles. These 2-phase composite copper plates have engineering use possibilities for anti-friction and anti-seizing problems.

3,666,637
PROCESS FOR METALLIZING SUBSTRATES

John K. MacKay, Niagara Falls, Ontario, Canada, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

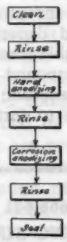
No Drawing. Filed Jan. 30, 1970, Ser. No. 7,257
Int. Cl. C23b *5/60*
U.S. Cl. 204—30 **9 Claims**

Substrates are plated with metals by subjecting the substrates to elemental phosphorus and subjecting the thus treated substrate to a metal salt bath comprising a metal salt, an amine, an alkali metal hydroxide and ammonium hydroxide. The resulting treated substrates can be electroless plated and/or electroplated by conventional techniques.

3,666,638
PROCESS FOR ANODIZING ALUMINUM MATERIALS

Frank L. Harris, 3803 Massachusetts Ave. SE., Washington, D.C. 20019, and Sidney Levine, 8505 Buckhannon Drive, Potomac, Md. 20854

Filed Apr. 21, 1970, Ser. No. 30,405
Int. Cl. C23f *7/06*
U.S. Cl. 204—35 N **6 Claims**



A method for producing an abrasion resistant anodic coating with a desired corrosion resistant characteristic on the surfaces of aluminum and alloys thereof comprising the steps of:

(1) initially anodizing the aluminum material in an acid bath at certain conditions of temperature, current density, voltage etc., in order to produce a dense, hard anodic coating;

(2) subject the material to another acid anodizing bath at certain temperatures, current density, voltage, etc., in order to develop a corrosion resistant anodic coating between the hard anodic coating and the base aluminum material thereby minimizing the effects of the microscopic discontinuities, and then

(3) sealing.

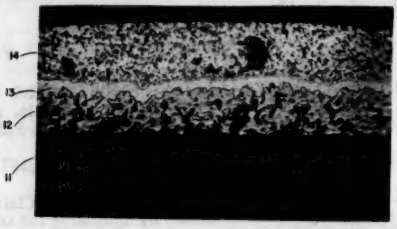
3,666,639
METHOD FOR COATING METALS OR INSULATING SUBSTRATES HAVING A VITREOUS BINDER

William S. De Forest, Seal Beach, Richard T. Heap, Stanton, Joseph C. Widmont, Newport Beach, and Harold Zagorin, Orange, Calif., assignors to North American Rockwell Corporation

Filed Oct. 30, 1969, Ser. No. 872,622
Int. Cl. C23f *17/00*; C23b *5/64*
U.S. Cl. 204—38 C **1 Claim**

A plated thick film composite and method of making of same comprising the plating of thick film conductors by electrodeposition of copper, nickel, rhodium, or other

metals or combinations thereof, in an acid sulfate plating solution containing at least one of said metals onto electrically conductive metal fired ceramic containing



borosilicate base binders. The invention herein described was made in the course of or under a contract or subcontract thereunder, with Air Force.

3,666,640

GOLD PLATING BATH AND PROCESS

Paul T. Smith, Pascoag, R.I., assignor to Sel-Rex Corporation, Nutley, N.J.

No Drawing. Continuation of abandoned application Ser. No. 851,495, Aug. 19, 1969, which is a continuation-in-part of application Ser. No. 486,553, Sept. 10, 1965. This application Apr. 23, 1971, Ser. No. 137,014

Int. Cl. C23b *5/28, 5/42*

U.S. Cl. 204—44 **6 Claims**

An electroplating bath and process for obtaining non-hazy, hard, brilliant gold deposits by the addition of a small quantity of a soluble arsenic, a soluble antimony or a soluble selenium compound to the plating solution, optionally including the addition of soluble base metal salts and chelating agents to further improve the properties of the deposit.

3,666,641

PROCESS FOR TREATING SUBSTRATES OF THIN MAGNETIC FILMS

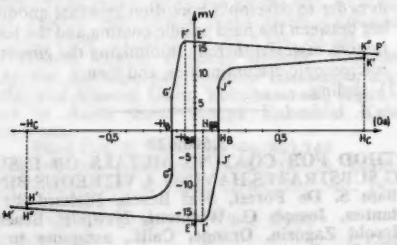
Rene Fernand Victor Girard and Marie-Claire Gidon, Grenoble, France, assignors to Societe Industrielle Honeywell Bull, Paris, France

Filed May 20, 1970, Ser. No. 39,032

Claims priority, application France, May 27, 1969, 6917172

Int. Cl. C23b *1/00*

U.S. Cl. 204—141 **12 Claims**



A process for treating the substrate of a thin magnetic film to obtain a surface state which reduces the sensitivity of the film to stray magnetic fileds and which improves the non-destructive readout properties of the film, wherein, prior to being coated with the magnetic film, the substrate is immersed in an acid electrolytic bath and employed as an electrode in such bath, and wherein the atack on the substrate in the bath is controlled by a current of constant density along the length of the substrate.

3,666,642

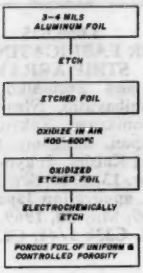
PROCESS OF FORMING ALUMINUM FOIL

Abdul Sahib Alwan, Tazewell, Va., and Ralph Antonio Ruscetta, Columbia, S.C., assignors to General Electric Company

Filed Mar. 19, 1971, Ser. No. 126,044

Int. Cl. C23b *1/00*

U.S. Cl. 204—141 **5 Claims**



An aluminum foil of controlled and uniform porosity is provided. The porous foil is made by a process comprising a first etching of the foil, an oxidation step, and a subsequent electrochemical etching of previously eached and oxidized foil. The porous aluminum foil of the invention is particularly useful in the construction of double anode electrolytic capacitors.

3,666,643

PRODUCTION OF BENZODIAZEPINE DERIVATIVES

Shigeho Inaba, Takarazuka, Tadashi Okamoto and Toshiyuki Hirohashi, Ashiya, Kikuo Ishizumi, Ikeda, Michihiro Yamamoto, Toyonaka, Isamu Maruyama, Minoo, Kazuo Mori, Kobe, Tsuyoshi Kobayashi, Minoo, and Hisao Yamamoto, Nishinomiya, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

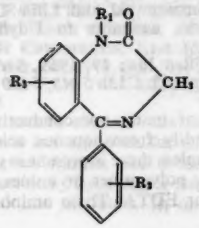
No Drawing. Filed Mar. 15, 1971, Ser. No. 124,493

Claims priority, application Japan, Mar. 19, 1970, 45/23,732

Int. Cl. C07d *53/06*

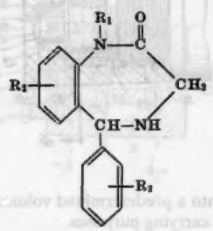
U.S. Cl. 204—158 **4 Claims**

Benzodiazepine derivatives represented by the formula



(I)

wherein R_1 is hydrogen, a lower alkyl or cycloalkylmethyl group; each of R_2 and R_3 is hydrogen or halogen atom, are prepared by irradiating a tetrahydrobenzodiazepine derivative represented by the formula,



(II)

wherein R_1, R_2 and R_3 are the same as defined above, with ultraviolet light or exposing the said tetrahydrobenzodiazepine derivative to sunlight.

The benzodiazepine derivatives have excellent analgetic, hypnotic, anti-convulsive and muscle relaxing activities.

3,666,644

PROCESS FOR PREPARING 2-HYDROXYALKYL-4(5)-NITROIMIDAZOLES

Janos Kollonitsch and Alan N. Scott, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 607,642, Jan. 6, 1967. This application July 31, 1969, Ser. No. 846,583

Int. Cl. C07d *49/36;* B01j *1/10*

U.S. Cl. 204—158 HA 8 Claims

2-hydroxyalkyl-4(5)-nitroimidazoles are prepared by chlorinating 2-alkylimidazoles to produce the 2-α-chloroalkylimidazole, nitrating this compound to produce the 2-α-chloroalkyl-4(5)-nitroimidazole, and hydrolyzing this compound to the corresponding 2-hydroxyalkyl compound. The 2-hydroxyalkyl-4(5)-nitroimidazoles are useful in the preparation of the corresponding (1-methyl-5-nitroimidazol-2-yl)-alkyl carbamates. The (1-methyl-5-nitroimidazol-2-yl)-alkyl carbamates are useful in the treatment of protozoal diseases.

3,666,645

MULTISTAGE POLYMERIZATION PROCESS WITH INDEPENDENTLY ADJUSTABLE RADIATION SOURCES

Jackson A. Ransohoff, Bethesda, Md., assignor to Neutron Products, Inc., Washington, D.C.

Filed June 1, 1967, Ser. No. 642,959

Int. Cl. C08f *1/16;* C08d *1/00*

U.S. Cl. 204—159.22 17 Claims

Emulsions and solutions of monomer are catalytically polymerized by irradiation by circulating a monomer containing process stream through a radiation field in a first stage, removing the heat of polymerization while maintaining temperature control, feeding from the first stage into a second process stage which is similar in operation to the first stage but with a higher proportion of polymer, and operating the second stage at a predetermined temperature, and continuing the steps of irradiation, under conditions of good temperature control until the reaction is completed or substantially completed. The volume of reactants exposed to the radiation field or the radiation dose to which the various process streams are exposed is adjusted to control the polymer content of each stage and provide for a steady flow of reactants through the system.

3,666,646

REDUCTION OF MOLECULAR WEIGHT IN POLYNUCLEOTIDES USING ULTRASONIC RADIATION

George P. Lampson, Hatfield, Alfred A. Tytell, Lansdale, Arthur K. Field, North Wales, and Maurice R. Hilleman, Lafayette Hill, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed May 15, 1970, Ser. No. 37,896

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 204—160.1 3 Claims

The invention disclosed herein relates to novel multistranded polynucleotide complexes having interferon-inducing activity and with pharmaceutical compositions thereof; with processes for preparing said complexes; and with methods for stimulating the production of interferon in living animal cells utilizing such complexes and compositions. More particularly, it relates to double-stranded complexes of polyriboinosinic acid and polyribocytidylic acid ($rI_n:rC_n$), in which the average molecular size of the polyribocytidylic acid components of the complex is substantially less than that of the polyriboinosinic acid components, and which are produced (a) by controlled synthesis of the individual homopolynucleotides, (b) by controlled depolymerization of either homopolynucleotides or polynucleotide complexes by exposing them to sonic radiation; or (c) by controlled depolymerization of the homopolynucleotide polyribocytidylic acid, by exposing it to ribonuclease degradation; such $rI_n:rC_n$ complexes possess maximal interferon-producing activity with minimal toxicity.

3,666,647

SEPARATION OF FRUCTOSE AND GLUCOSE

Tetsujiro Kubo, 783 Seijo-machi, Setagaya-ku, Tokyo, Japan, and Ryoki Tatuki, 16 Aza Tera-machi, Goshogawara-shi, Aomori-ken, Japan

No Drawing. Filed Feb. 5, 1970, Ser. No. 9,079

Claims priority, application Japan, Feb. 17, 1969, 44/11,053; Aug. 26, 1969, 44/66,880; Dec. 20, 1969, 44/102,095

Int. Cl. B01d *13/02*

U.S. Cl. 204—180 P 6 Claims

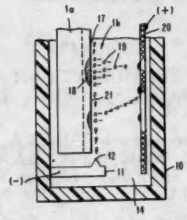
Fructose can be recovered from a sugar solution containing fructose and glucose, such as an invert sugar solution or an isomerized sugar solution, in the form of a calcium chloride double salt thereof, and then the fructose can be separated from the double salt by passing an aqueous solution of the double salt through an electrodialysing device having an ion exchange membrane, the sugar solution containing the fructose and the glucose being used as the condensing liquor.

3,666,648

IN-SITU RECLAMATION OF MASTER PATTERNS FOR PRINTING MICROCIRCUIT IMAGES ON REVERSELY SENSITIZED MATERIAL

Daniel J. Lasky, Wappingers Falls, and Harold C. Weisel, Pawling, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 5, 1969, Ser. No. 874,178
Int. Cl. B01k *5/02*
U.S. Cl. 204—180 R 12 Claims



Master pattern silver emulsion images of microelectronic artwork are altered in situ so that they can be used as master patterns to provide photocopies of the reverse images. The silver is dissolved out and the remaining gelatin relief is dyed to a threshold level of opaqueness by an absorbed dye to produce the reversed master pattern image. Results of unusually fine detail resolution and contrast quality are achieved with substantial cost savings. Costs and risk of damage, due to excessive handling of the hard-to-replace masters in the alteration process, are reduced with undiminished quality of results by employing electrical means to control agitation of the silver dissolving agent. In a preferred exemplification, handling is further reduced by combining dissolution and dyeing phases of the process into one operation. Images on the reversed masters have better edge contrast quality than the original masters. This effect is used to advantage to improve masters which originally have poor edge definition.

3,666,649

POLYACRYLIC ACID IN ELECTROCOATING

Kazys Sekmakas, Chicago, and Lester A. Henning, Buffalo Creek, both of Ill., assignors to De Soto, Inc., Des Plaines, Ill.

Filed Oct. 3, 1969, Ser. No. 863,701
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 12 Claims

High molecular weight polyacrylic acid polymers are added in small amount to an aqueous material containing dispersed carboxy-functional resin to improve electrodeposition at the anode and to lower the gloss of the coating which is deposited.

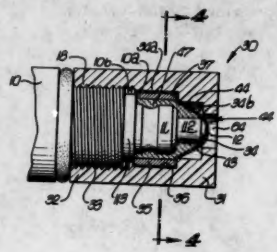
3,666,650

FLUID SENSOR CAP ASSEMBLY

Thaddeus M. Donigulan, Laguna Beach, Calif., assignor to I.M.I., Division of Becton, Dickinson and Company, Newport Beach, Calif.

Filed May 6, 1970, Ser. No. 35,187
Int. Cl. G01n *27/30*
U.S. Cl. 204—195 P 3 Claims

Membrane type polarographic oxygen sensors are constructed to be uniformly rechargeable with electrolyte by introducing a selected quantity of electrolyte into a tubular cap for reception at the electrode side of a membrane in the cap; the cap is then assembled into the sensor body in such manner as to bring the electrolyte into contact with the



cathode tip, and into a predetermined volume space adjacent the tip for current carrying purposes.

3,666,651

MEASURING COMBINED ELECTRODE

Hirokuni Makabe, Higashimurayama, Tokyo, Japan, assignor to Toa Electronics Limited, Tokyo, Japan

Filed June 30, 1969, Ser. No. 837,440
Claims priority, application Japan, July 2, 1968, 43/55658
Int. Cl. G01n *27/36*
U.S. Cl. 204—195 G 3 Claims

A pH measuring combined electrode including a glass electrode, a reference electrode and a thermosensitive resistance element for temperature compensation integrated into a compact miniaturized assembly. At least the inner electrode of the glass electrode is constituted by a glass-coated lead-in wire and the thermosensitive resistance element is arranged in direct proximity to the inside wall of the pH sensitive glass membrane of the glass electrode. A guard ring is preferably provided around an electrode supporting tube to assist in maintaining clearance between the lead-in wires at their juncture with the electrode assembly.

3,666,652

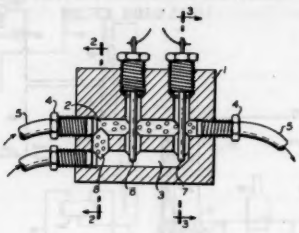
TITRATION POTENTIAL MEASUREMENT

Werner Krauer; Alfred Adalbert Martinelli, both of Zurich, and Friedrich Oehme, Bassersdorf, all of Switzerland, assignors to Polymetron Ltd., Glattbrugg, Switzerland

Filed Mar. 18, 1970, Ser. No. 20,673
Claims priority, application Switzerland, Mar. 21, 1969, 4280
Int. Cl. G01n *27/08*
U.S. Cl. 204—195 R 3 Claims

Titration potential measurement providing means including both method and apparatus for eliminating the interference of gas accumulations in the titrated sample to interfere with accuracy of potential measurement. This is accomplished by flowing the titrated sample through a potential

measuring chamber having an upper and lower flow path for the titrated sample, with two spaced electrodes extended into the lower flow path, whereby gas accumulations in the sample will rise to the upper flow path, while measurements are made in the relatively gas free portions of the sample in the lower flow path.

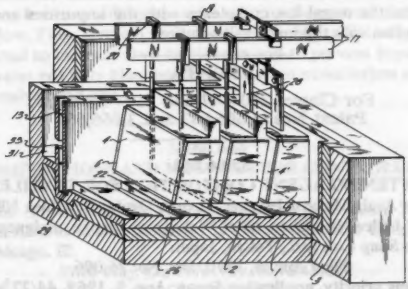


3,666,653

CRYOLITIC LININGS IN FURNACES FOR ALUMINUM SMELTING

Giuseppe De Varda, Milan, Italy, assignor to Montecatini Edison S.p.A., Milan, Italy

Filed July 6, 1967, Ser. No. 652,998
Claims priority, application Italy, July 6, 1966, 15623/66
Int. Cl. C22d 3/02; B01k 3/08
U.S. Cl. 204—243 R **5 Claims**



Disclosed is an improvement in furnace vats for fused bath electrolysis of alumina which comprises a refractory mass of substantially pure natural or synthetic cryolite or of cryolite-alumina mixtures in which a dispersion of carbon grit is within the refractory mass. Also disclosed is a process for preparing said mass.

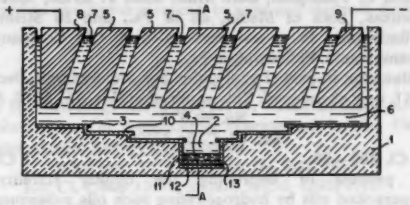
3,666,654

FURNACES WITH BIPOLAR ELECTRODES FOR THE PRODUCTION OF METALS, PARTICULARLY ALUMINUM, THROUGH ELECTROLYSIS OF MOLTEN SALTS, EQUIPPED WITH AUXILIARY HEATING FACILITIES

Giorgio Olah De Garab, 18, Via Angera, Milan, Italy

Filed Sept. 22, 1969, Ser. No. 859,790
Claims priority, application Italy, Sept. 24, 1968, 21584 A/68
Int. Cl. C22d 3/02; B01k 3/00
U.S. Cl. 204—243 R **7 Claims**

A furnace with bipolar electrodes for the production of metals, particularly aluminum, through the electrolysis of molten salt baths. Electrical heating resistors, selected from graphite fabrics, tapes and felts, are placed in the "cold" zones of said furnace.

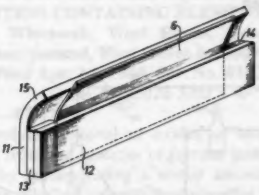


3,666,655

DEVICE FOR HOLDING AND GUIDING A BENDABLE STRIP IN ELECTROPHORESIS

Nils Goran Nybom, deceased, Late of Kristianstad, Balsgard, Postlada 550, Sweden (by Ethel Barbro Louise Nybom, administratrix)

Filed Jan. 25, 1971, Ser. No. 109,516
Claims priority, application Sweden, Jan. 30, 1970, 1208/70
Int. Cl. B01k 5/00
U.S. Cl. 204—299 **4 Claims**



Apparatus for electrophoresis includes a trough from which electrolyte is conducted by means of a bendable porous strip dipping into the electrolyte to a plate having a layer thereon to be moistened by and brought into contact with the electrolyte. To properly bend and guide the strip between the trough and the layer to be moistened, one side of the strip is secured within a holder which rests within the trough and is provided with a curvilinear portion which engages the strip and simultaneously bends and the other side of the strip into a pressing engagement with the layer to be moistened with the electrolyte.

3,666,656

METHOD FOR INHIBITING FOULING IN A REFINERY PROCESS

Maurice E. Stanley, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 30, 1970, Ser. No. 76,992
Int. Cl. C10g 9/16, 9/36; C23f 14/00
U.S. Cl. 208—48 AA **8 Claims**

Method of treating petroleum hydrocarbon liquids to inhibit the fouling of refinery process equipment involving the addition of an anti-fouling amount of an oil-soluble addition type copolymer containing in combined form as its essential monomeric components copolymerizable ethylenically unsaturated compounds each containing only one polymerizable ethylenic linkage, at least one of which component is amine free and contains from 4 to about 18 carbon atoms, one of the components contains a basic aminonitrogen in the side chain and one of the components contains a hydrocarbon-substituted-amide in the side chain.

3,666,657

OIL STABILIZING SEQUENTIAL HYDROCRACKING AND HYDROGENATION TREATMENT

Sheldon L. Thompson, Glen Mills; Rene F. Kress; Albert T. Olenzak, both of Media, all of Pa., and Ib Steinmetz, Wilmington, Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 694,096, Dec. 28, 1967, now abandoned. This application Nov. 16, 1970, Ser. No. 90,073

Int. Cl. C10g *37/06*

U.S. Cl. 208—58 7 Claims

A process of improving the quality stability of hydrocracked oils by hydrogenating such oils subsequent to the hydrocracking treatment. The hydrocracking conditions comprise a temperature of from 700° to 900° F. and preferably from 700° to 800° F. and a pressure of at least about −500 psi and preferably at least about 1,500 psi over a sulfided mixture of Group VI B metal and Group VIII metal as a catalyst. The hydrogenation conditions comprise a temperature of from about 600° and preferably 625° to 675° F. a pressure of at least about 3,000 psi and the same catalysts as used for the hydrocracking operation.

3,666,658

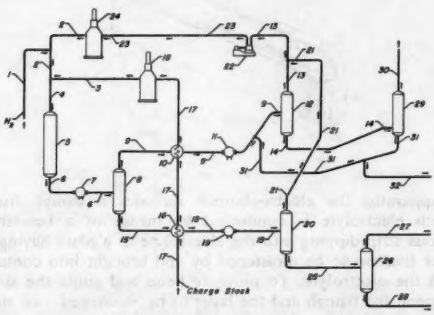
HYDROPROCESSING PRODUCT SEPARATION

Newt M. Hallman, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 23, 1970, Ser. No. 91,969

Int. Cl. C10g *13/00, 37/00*

U.S. Cl. 208—103 15 Claims



Separation of the effluent from a high temperature high pressure hydroprocessing reaction by first separating the effluent in a high pressure, high temperature separator to produce a vapor phase (I) and liquid phase (I). Vapor phase (I) is cooled and separated at a high pressure to produce liquid phase (II) and hydrogen rich phase (II). Liquid phase (I) is cooled and separated at a high pressure to produce hydrogen rich phase (III) and liquid phase (III). Hydrogen rich phases (II) and (III) are of sufficient hydrogen purity for recycle to the reaction.

3,666,659

METHOD FOR STABILIZING HYDRODESULFURIZED OIL

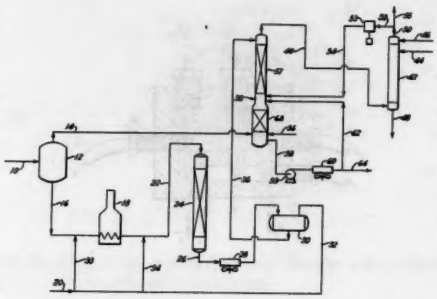
Edgar Carlson, Allison Park, Pa., and William R. Lehrian, Tokyo, Japan, assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 24, 1970, Ser. No. 22,200

Int. Cl. C10g *23/00*

U.S. Cl. 208—208 R 9 Claims

A stabilized, desulfurized hydrocarbon oil is provided by separating the oil feed into light and heavy fractions, desulfurizing the heavy fraction and combining the desulfurized heavy fraction and the untreated light fraction after removing hydrogen sulfide from the heavy fraction. A hydrogen sulfide-depleted recycle stream provides for absorption of light hydrocarbons into the desulfurized heavy fraction. The stabilized, desulfurized hydrocarbon oil has a light ends content approximating that of the original oil feed.



3,666,660

PURIFICATION OF A HYDROCARBON STREAM WITH CR^{+++} IONS IN SOLUTION

Ralph Bernheimer, East Brunswick, N.J., assignor to Esso Research and Engineering Company

Filed Apr. 30, 1970, Ser. No. 33,481

Int. Cl. C10g *29/06*

U.S. Cl. 208—243 1 Claim

Polynuclear aromatic hydrocarbons, and other aromatic compounds and organic sulfur and nitrogen compounds are removed as impurities from petroleum streams by extraction with Cr^{+++} in a solution of acetone, methanol or ethanol wherein the metal ion complexes with the impurities and is withdrawn with the metal salt solution.

ERRATA

For Classes 210—47 and 210—58 see:
Patent Nos. 3,666,663 and 3,666,664

3,666,661

SOFTENING AGENT COMPOSITION FOR TEXTILES

Sumio Arai; Masaru Inouye; Yuzuro Ogata; Yukihisa Niimi, and Uitiro Nishimoto, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1970, Ser. No. 26,096

Claims priority, application Japan, Apr. 9, 1969, 44/27362

Int. Cl. D06m *13/18*

U.S. Cl. 252—8.9 3 Claims

A softening agent composition for textiles containing an epichlorohydrin adduct of sorbitan higher fatty acid mono- or diester, which is a novel softening agent compound, and an ethoxylated product of mono-, di- or triglyceride of 12-oxy steric acid, which composition can be advantageously used as the softener in a conventional resin finishing process.

3,666,662

ALKALI METAL SUCCINAMATE COMPOSITIONS FOR LUBRICATING OILS

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 23, 1970, Ser. No. 31,412

Int. Cl. C10m *1/54*

U.S. Cl. 252—33.6 11 Claims

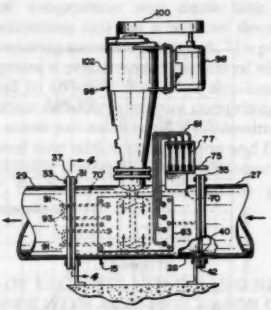
Compositions are provided useful in lubricating oil for detergency, dispersancy, antiwear and acid neutralization, which are the reaction product of an alkali metal metaborate and a succinimide in the presence of water, the presence of excess alkali metal metaborate being contemplated.

3,666,663

METHOD AND APPARATUS FOR DISPERSING COAGULANT INTO A WATER STREAM

James Donald Walker, Aurora, Ill., assignor to Chicago Bridge & Iron Company

Filed Nov. 24, 1969, Ser. No. 879,410
Int. Cl. B01d 21/01
U.S. Cl. 210—49 9 Claims



A chemical additive is thoroughly and almost instantaneously mixed with huge quantities of water flowing through a large pipe or flume by dividing the additive into equal smaller streams, and feeding the chemical additive streams separately but at equal rates to a plurality of points equally distributed along the cross-section of the flow and vigorously churning the combined stream at a point just downstream from this feeding of the chemical solution. The churning is preferably by opposed propellers. Two propellers on a shaft, or on each of a plurality of shafts, each impel the water in the direction toward the other. As the water leaves the churn zone, it passes between stilling vanes parallel to the general direction of flow. Flow through the unit is preferably sufficiently constricted to increase flow turbulence and to prevent bypassing of water not fully blended, but the system nevertheless avoids excessive head loss.

3,666,664

COMPOSITIONS AND METHODS FOR CONTROLLING SCALE

Walter F. Lorenc, Harvey, and Roland A. Berner, Tinley Park, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed May 12, 1971, Ser. No. 142,822
Int. Cl. C02b 5/06
U.S. Cl. 210—58 12 Claims

Compositions and methods used to inhibit scale formation and/or the formation of solid scale forming salts comprises adding to water small amounts of a synergistic combination of nitrilotriacetic acid and a specific organophosphate.

3,666,665

COMPOSITION OF FERROELECTRIC MATTER

Daniel W. Chapman, San Jose; John D. Michaelsen, Los Gatos, and Frederick J. Stryker, San Jose, all of Calif., assignors to International Business Machine Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 769,757, Oct. 22, 1968, now abandoned. This application Dec. 14, 1970, Ser. No. 98,088
Int. Cl. C04b 35/48, 35/50; G11b 9/02
U.S. Cl. 252—62.9 12 Claims

Ferroelectric solid solutions simultaneously containing lead, iron, niobium, bismuth, zirconium, lanthanum, and oxygen are synthesized and sintered at temperatures lower than 1,000° C. Polycrystalline layers and films of such compositions are prepared by radio-frequency sputtering, electron beam evaporation, chemical spray deposition, or centrifuge deposition. Layers of such compositions only a few microns or fractions of a micron thick when on a conductive substrate are used as non-linear elements in logic and memory devices.

3,666,666

FERROELECTRIC CERAMIC MATERIALS

Gene H. Haertling, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 17, 1969, Ser. No. 885,789
Int. Cl. C04b 35/46, 35/48, 35/50; G02f 1/26
U.S. Cl. 252—62.9 7 Claims

An electrooptic ferroelectric ceramic material of a lead lanthanum zirconate titanate solid solution having about 5 to 25 atom percent lanthanum with the ratio of zirconium to titanium varying from about 5/95 to about 95/5, hot-pressed, having an optical transmittance throughout the visible spectrum of about 100 percent for optically polished plates about 0.25 millimeters thick, with an effective birefringence of from about −0.003 to −0.03 at saturation remanence polarization to near zero as the remanent polarization is switched to electrical zero, and an effective electrooptic coefficient at saturation remanence from about 1×10^{-2} to 5×10^{-2} m²/C, and for memory applications a coercive field from about 2 to 10kV/cm.

3,666,667

ALKALINE CYANIDE-FREE AQUEOUS DESCALING COMPOSITION CONTAINING ELEMENTAL SULFUR

Theophil J. Wieczorek, West Haven, Conn., assignor to Enthone Incorporated, West Haven Industrial Park, Conn.

Filed Apr. 14, 1969, Ser. No. 816,089
Int. Cl. C02b 5/02
U.S. Cl. 252—87 22 Claims

The electrolytic removal of oxides of iron, such as rust and/or scale, from the surfaces of ferrous metals is materially accelerated by incorporating a minor amount of elemental sulfur into the alkaline cyanide-free aqueous electrolyte also containing a complexing agent capable of complexing iron ions into soluble form, and an alkaline material, and having a pH of above 10. Concentrate compositions adapted to be mixed together with water to form the electrolyte are also embodied within the invention.

3,666,668

CLEANSER, DISINFECTANT, COMBINATIONS THEREOF AND AEROSOL SYSTEMS CONTAINING SAME

Kenneth Klausner, Havertown, Pa., assignor to The Drackett Company, Cincinnati, Ohio

Filed Nov. 21, 1967, Ser. No. 684,630
Int. Cl. C11d 3/48, 1/18
U.S. Cl. 252—90 12 Claims

A compatible cleansing composition comprising pine oil, ammonium hydroxide and an ethoxylated alcohol. A disinfectant formulation particularly adapted for aerosol applications comprising a halogenated salicylanilide and a quaternary morpholinium alkyl sulfate. Disinfectant-cleanser compositions comprising said aforementioned cleanser and disinfectant in combination. Pressurized aerosol containers containing all of the foregoing.

3,666,669

FISHERMAN'S SOAP

John Paul Noordam, Jr., 6239 South 40th St., Omaha, Nebr.

Filed May 13, 1970, Ser. No. 37,053
Int. Cl. A01k 85/00; C11d 9/38, 9/44
U.S. Cl. 252—132 2 Claims

A soap with which fishermen can wash bait and with which a fisherman can wash his hands for preventing excessive

human scent from remaining on the bait and for providing the bait with sufficient anise oil and cinnamon to substantially help in attracting fish to the bait.

3,666,670

PULVERULENT DRAIN CLEANING COMPOSITION

Daniel Eugene Gilbert, Derby; Larry Ralph Nelson; Charles Edwin Sturgeon, both of Wichita, and Robert Keith Thom, Derby, all of Kans., assignors to Vulcan Materials Company, Birmingham, Ala.

Filed Aug. 1, 1969, Ser. No. 846,968
Int. Cl. C11d *3/14;* B01j *11/60*
U.S. Cl. 252—160 7 Claims

A free flowing, pulverulent drain cleaning composition is made by mixing an alkali metal hydroxide such as caustic soda; a halogenated lower aliphatic hydrocarbon such as perchloroethylene, methylene chloride or methylchloroform; particulate silica; and a wetting agent.

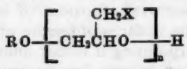
3,666,671

DETERGENT COMPOSITION AND PROCESS OF SHAMPOOING HAIR THEREWITH

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Montjay-La-Tout, both of France, assignors to Societe anonyme dite: L'Oreal, Paris, France

Continuation-in-part of application Ser. No. 780,300, Nov. 29, 1968, now Patent No. 3,578,719, Continuation-in-part of application Ser. No. 544,095, Apr. 21, 1966, now abandoned. This application Aug. 1, 1969, Ser. No. 846,929
Claims priority, application France, Nov. 22, 1965; 49902; Apr. 23, 1965, 48458; Apr. 6, 1966, 50850; Dec. 1, 1967, 130713
Int. Cl. B01f *17/42;* C11d *1/72, 1/825*
U.S. Cl. 252—173 12 Claims

Cosmetic shampoo and detergent compositions containing surface active compounds having the formula



in which R is a lipophile group, X is OH or halogen and *n* is 1–10.

3,666,672

HYDROGEN GENERATING COMPOSITIONS

Ralph H. Hiltz, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 631,858, Apr. 19, 1967, now abandoned. This application Dec. 24, 1969, Ser. No. 888,035
Int. Cl. C01b *1/03;* B01j *7/00*
U.S. Cl. 252—188 6 Claims

An autogeneously combustible composition that liberates hydrogen on burning contains an alkali metal borohydride and a hydrazine sulfate in proportions such that there are between about 0.5 to 2 boron atoms for each nitrogen atom.

3,666,673

METHOD OF DISPOSING OF RADIOACTIVE ORGANIC WASTE SOLUTIONS

Kenneth C. Knoll, Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 24, 1969, Ser. No. 888,048
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 W 1 Claim

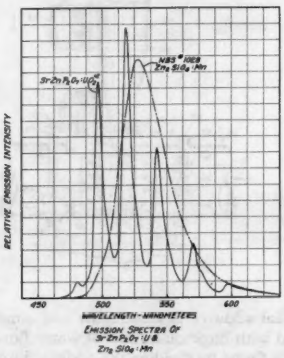
Radioactive organic waste solutions may be disposed of and the radioactive material contained therein may be concentrated by passing the wastes as a liquid or vapor into a suitable preheated oxidation catalyst in the presence of air and collecting the radioactive residue from the oxidized organic wastes.

3,666,674

URANYL-ACTIVATED STRONTIUM ZINC PYROPHOSPHATE PHOSPHORS

Mary V. Hoffman, South Euclid, Ohio, assignor to General Electric Company

Continuation-in-part of application Ser. No. 710,391, Mar. 4, 1968, now abandoned. This application Feb. 24, 1969, Ser. No. 805,972
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.1 R 6 Claims



EMISSION SPECTRA OF $Sr_2ZnP_2O_7:U$ & $Zn_2SiO_4:Mn$

Uranyl-activated strontium zinc pyrophosphate, with allowable substitution of minor amounts of barium for strontium and cadmium for zinc, efficiently produces green light having sharp emission peaks particularly suitable for reprographic work in monochrome copying of materials of various colors. Also, rare earth ions such as Eu^{+3} can be substituted for small amounts of strontium, preferably using K^{+1} for charge compensation. This adds red peaks to the emission.

3,666,675

METHOD FOR PRODUCING LUMINESCENCE USING COMPLEX LUMINESCENT MATERIALS

Zvi Dori, Meadowbrook, and Ronald F. Ziolo, Philadelphia, both of Pa., assignors to Temple University, Philadelphia, Pa.

Filed Jan. 21, 1970, Ser. No. 4,749
Int. Cl. C09k *1/02*
U.S. Cl. 252—301.2 R 10 Claims

Luminescence is produced by stimulating a ligand compound wherein the ligand forming atom, either phosphorus or arsenic, is bound in a complex molecule with three organic radicals, at least one of which is phenyl or tolyl, which in turn is complexed with a metal having a closed d^{10} outer shell.

3,666,676

TERBIUM ACTIVATED RARE EARTH OXYHALIDE PHOSPHORS CONTAINING YTTERBIUM FOR REDUCED AFTERGLOW

Jacob G. Rabatin, Chardon, and Evelyn Bradshaw, East Cleveland, both of Ohio, assignors to General Electric Company

Filed Dec. 21, 1970, Ser. No. 100,448
Int. Cl. C09k *1/08*
U.S. Cl. 252—301.4 R 2 Claims

Phosphors of reduced afterglow having the inclusion of a selected impurity in the phosphor lattice. More specifically, rare earth oxyhalide phosphors of reduced phosphorescence comprising lanthanum and gadolinium oxyhalide phosphors activated with terbium including the selected impurity ytterbium.

3,666,677

SHORT PERSISTENCE ZINC SULFIDE BLUE PHOSPHOR AND METHOD OF PREPARING SAME

Philip C. Fisher, Jr., and Kenneth H. Shaner, both of Towanda, Pa., assignors to Sylvania Electric Products Inc.

Continuation of application Ser. No. 816,816, Apr. 16, 1969, now abandoned. This application Apr. 29, 1971, Ser. No. 138,739

Int. Cl. C09k *1/12*

U.S. Cl. 252—301.6 S 6 Claims

A phosphor composition that emits blue color under cathode ray excitation and has a reduced decay time and a process for preparing same are disclosed. The phosphor composition comprises a predominant portion of silver-activated zinc sulfide and an effective amount of aluminum oxide. The process comprises forming a mixture comprising an effective amount of an aluminum source and a predominant portion of a silver-activated zinc sulfide composition and firing the mixture in an oxidizing atmosphere at a temperature of above about 1,700° F. for a time sufficient to produce said phosphor composition.

3,666,678

PROCESS OF ENCAPSULATING BASIC NITROGEN COMPOUNDS WITH ACID-PRECURSOR GELATIN

Benjamin Mosier, Houston, Tex., and Charles E. Tippett, Dayton, Ohio, assignors to said Benjamin Mosier

Continuation-in-part of application Ser. No. 433,501, Feb. 17, 1965, now abandoned, which is a continuation-in-part of application Ser. No. 316,540, Oct. 16, 1963, now abandoned. This application Jan. 12, 1968, Ser. No. 697,306

Int. Cl. B01j *13/02*; C23f *11/14*; A01n *17/00*

U.S. Cl. 252—316 11 Claims

Process of microencapsulation employing acid precursor (type A) gelatin as the encapsulating macrocolloid, particularly applicable to the formation of liquid center microcapsules containing a basic (cationic) nitrogen compound. For example, an aqueous solution of acid-precursor gelatin is mixed at an alkaline pH with a water-immiscible organic solvent solution of the nitrogen compound, such as an amine or quaternary. The pH of the mixture and the gelatin phase is reduced to at least 4.0 and preferably 3.0 or below, the liquid phases being intermixed to disperse and emulsify the organic solvent phase in the aqueous phase, thereby providing minute droplets of the basic nitrogen containing organic solvent surrounded by the aqueous solution of the acid-precursor gelatin. On the completion of the pH reduction, the gelatin will have formed a coating around the individual droplets to provide encapsulating skins therefor. While the encapsulated droplets can be recovered with some success at the lowest acid pH, it is much preferred to raise the pH to a pH at least above 5.5 and preferably to an alkaline pH before recovering the microcapsules. An auxiliary coating can be applied to the recovered microcapsules by contacting them with an aqueous solution of alkali-precursor gelatin.

3,666,679

CHLORINE STABLE POWDER GELLING COMPOSITION

Homer E. Crotty; Charles R. Coffey, both of Cincinnati, and Thomas C. Tesdahl, Forest Park, all of Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 749,585, Aug. 2, 1968, now Patent No. 3,578,499. This application Apr. 23, 1970, Ser. No. 31,373

Int. Cl. B01j *13/00*

U.S. Cl. 252—316 2 Claims

The disclosed invention is for a gelling composition which when added to water forms a gel useful for stabilizing a chlorine release additive. A significant advantage of this invention is the increased chlorine stability and hence increased available chlorine for cleaning and sanitizing during contact of the gel and a solid surface. The gelling composition consists essentially of (A) an anionic heteropolysaccharide biopolymer gelling agent, (B) a neutral diluent selected from the group consisting of Na_2SO_4 and NaCl, (C) a linear alkyl benzene sulfonate wherein the alkyl group includes from 12 to 14 carbon atoms, (D) propylene glycol liquid dispersing agent, and (E) fluorescein dye.

3,666,680

METHOD OF COMBINING OPTICAL BRIGHTENERS WITH POLYMERS FOR STABILITY IN BLEACH AND ENCAPSULATED PRODUCT

Benjamin R. Briggs, Los Alamitos, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.

Filed Mar. 5, 1970, Ser. No. 16,926

Int. Cl. B01j *13/02*; B44d *1/14*

U.S. Cl. 252—316 20 Claims

Optical brighteners are protected against oxidative degradation by aggressive environments such as aqueous hypochlorite bleach to be effectively depositable onto fabrics from bleach by combining the brightener with emulsion polymer prepared from a major portion of the polymer precursors and encapsulating the brightener-polymer combination with the balance of the polymer precursors. Suitable precursors are styrene and acrylic or methacrylic acid, in weight ratios of 65 to 98 parts of the former to two to 35 parts of the latter.

3,666,681

ANTIFOAM PREPARATION FOR AQUEOUS SYSTEMS

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 16, 1970, Ser. No. 20,040

Int. Cl. B01d *17/00*

U.S. Cl. 252—358 4 Claims

The present invention relates to an antifoaming preparation for aqueous systems consisting essentially of a water insoluble organic liquid, e.g., mineral oil; a filler; a hydroxyl endblocked organopolysiloxane or a benzene soluble organopolysiloxane resin; and an ingredient, e.g., KOH, a hydrocarbon amine, ammonia, or hexamethyldisilazane which would lend compatibility between the filler and the silicone fluid or silicone resin component. The preparations in question would be particularly useful in the pulp and paper industry.

3,666,682

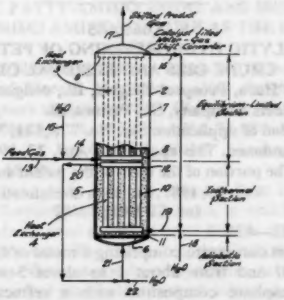
WATER-GAS SHIFT CONVERSION PROCESS

James R. Muenger, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,254

Int. Cl. C01b *2/06*

U.S. Cl. 252—373 10 Claims



A water-gas shift conversion process in which a feed gas mixture is subjected to successive contacts with catalyst and

the temperature of the reacting gases contacting the shift conversion catalyst is controlled by indirect concurrent heat exchange with the feed gas mixture.

3,666,683

SCINTILLATION COUNTING COMPOSITION CONTAINING OXDIAZOLE

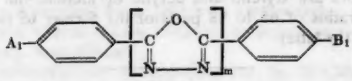
Erwin Maeder, Eichbergweg 14, Aesch/Bl; Rudolf Anliker, Rottmannsbodenstrasse 107, Binningen; Karl Schmid, Schoenenbachstrasse 38, Reinach/Bl, and Adolf Emil Siegrist, Weissensteinstrasse 37, Basel, all of Switzerland

Original application Sept., 1966, Ser. No. 577,168, now abandoned. Divided and this application June 9, 1969, Ser. No. 832,881

Int. Cl. C07d *85/54*; G01t *1/204*

U.S. Cl. 252—408 8 Claims

The invention relates to a composition of matter for counting atomic disintegrations of radioactive material which is accompanied by emission of β-rays which contains an oxdiazole compound of the formula



wherein A_1 is a branched chain alkyl, B_1 is hydrogen, phenyl, lower alkyl, or lower alkoxy, and m is 1 or 2. The counts per minute emitted by the material dispersed in the scintillation liquid are measured with a suitable instrument such as a liquid scintillation spectrometer.

3,666,684

METAL FERRITE CATALYST ACTIVATION WITH A LARGE AMOUNT OF HALOGEN

Frank Koslosky, Jr., Pasadena, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed June 1, 1970, Ser. No. 42,553

Int. Cl. B01j *11/22*, *11/64*; C07c *5/18*

U.S. Cl. 252—415 8 Claims

A partially deactivated metal ferrite oxidative dehydrogenation catalyst can be reactivated by contacting the catalyst with a relatively large amount of halogen. For example the yield from a Mg ferrite used in the oxidative dehydrogenation of n-butenes to butadiene had declined from 55.1 to 52.4 percent after 1,350 hours on stream. The catalyst was treated with up to 6,800 ppm of chlorine and after termination of the halogen and removal of residual halogen the yield was 55.9 percent. It was not necessary to remove the catalyst for activation or to stop the oxidative dehydrogenation.

3,666,685

CATALYTIC HYDROREFINING OF PETROLEUM CRUDE OILS AND RESIDUAL OILS

Mark J. O'Hara, Prospect Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation of application Ser. No. 775,521, Nov. 13, 1968, now abandoned. This application Apr. 23, 1970, Ser. No. 43,306. The portion of the term of the patent subsequent to Aug. 25, 1987, has been disclaimed.

Int. Cl. B01j *11/82*

U.S. Cl. 252—432 6 Claims

A catalyst composite comprising a metal of Group VIB and Group VIII and from about 1 to about 5 weight percent boron phosphate composited with a refractory inorganic oxide and characterized by a pore volume of at least about 0.4 cc. per gram in the 100–500 A. range. The catalyst composite is particularly useful for hydrorefining petroleum crude oils and residual crude oils.

3,666,686

PRODUCTION OF STABILIZED ALUMINUM BROMIDE SOLUTIONS

Pankajkumar Mahasukhral Trivedi, St. Louis, Mich., assignor to Michigan Chemical Corporation, St. Louis, Mich.

Filed May 7, 1969, Ser. No. 822,710

Int. Cl. B01j *11/78*

U.S. Cl. 252—429 3 Claims

Stabilized solutions of aluminum bromide in cyclohexane are produced by adding 0.5 – percent by volume of benzene or 0.5 – 2 percent by weight of triphenol [1,1,3(3-hydroxyphenyl) propane]. The rapid degradation of unstabilized solutions at room temperature is markedly retarded for a period of at least 30 days so that the solutions may be shipped and stored and used instead of solid aluminum bromide as a Lewis acid type catalyst.

3,666,687

SULFUR PROMOTED METAL FERRITE OXIDATIVE DEHYDROGENATION CATALYST

Louis J. Croce, Seabrook, Tex., and Laimonis Bajars, Princeton, N.J., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Sept. 19, 1969, Ser. No. 859,565

Int. Cl. B01j *11/74*

U.S. Cl. 252—439 10 Claims

The yield in oxidative dehydrogenation of organic compounds using metal ferrite catalyst is improved by having a sulfur promoter present either as part of the catalyst or added to the reaction with the reactants.

3,666,688

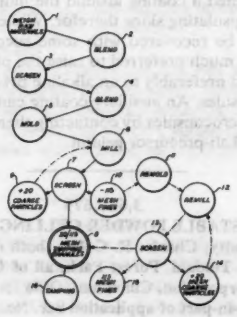
TAMPING MATERIAL

William Eugene McCafferty, St. Mary's, Pa., assignor to Airco Inc., New York, N.Y.

Original application Nov. 27, 1968, Ser. No. 779,659, now Patent No. 3,510,710, dated May 5, 1970. Divided and this application Apr. 1, 1970, Ser. No. 24,746

Int. Cl. H01b *1/04*

U.S. Cl. 252—503 3 Claims



A tamping material for securing electrical connections to carbon blocks comprises finely divided granules composed of 85 percent to 97 percent by weight graphite and 15 to 3 percent by weight resin binder.

3,666,689

SOLID COMPOSITIONS

Aleksander Jerzy Groszek, and Rodney Ernest Witheridge, both of London, England, assignors to The British Petroleum Company Limited, London, England

Filed Mar. 28, 1969, Ser. No. 811,644
Claims priority, application Great Britain, Apr. 2, 1968, 15,721/68
Int. Cl. H01b 1/02
U.S. Cl. 252—512 5 Claims

Polymeric compositions based on, e.g., polyethylene or poly vinyl chloride containing ultra-fine metal flakes produced by grinding metals in an organic liquid are electrically conductive. The specific resistance can be decreased in some cases to less than 10^{-1} ohm. cm.

3,666,690

SKIN CLEANSING COMPOSITION

Robert Francis Bann, Bridgewater Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 12, 1970, Ser. No. 89,065
Int. Cl. C11d 1/38
U.S. Cl. 252—547 4 Claims

A skin-cleansing composition for the removal of dye stains caused by basic triphenylmethane dyes, such as malachite green, comprising, in defined proportions, (1) a cationic surface-active quaternary ammonium salt containing a long-chain alkyl substituent, (2) mineral oil, (3) lanolin, (4) glycerine, (5) an alkali metal sulfite, (6) sodium carboxymethyl cellulose and (7) water.

3,666,691

SOLVENT RECLAIMING OF SYNTHETIC RESINS

Lester L. Spiller, 3733 East 55th St., Indianapolis, Ind.

Filed June 11, 1970, Ser. No. 45,404
Int. Cl. C08f 47/24
U.S. Cl. 260—2.3 10 Claims

Synthetic resins, and particularly polyvinyl chloride, coated on copper are reclaimed by pouring thereover a mixture of organic solvents containing trichlorethylene and dimethyl sulfoxide as the essential solvents. The solvent mixture is preheated to a temperature in the range of 50°–100° C. and the material being reclaimed is held in an autoclave at a pressure of at least 5 p.s.i. gauge so that the resin being reclaimed is contacted by the solvent mixture in both the liquid and vapor phases.

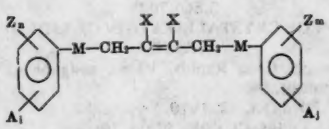
3,666,692

FLAME RETARDANT POLYPROPYLENE AND POLYURETHANE

William P. Paige, and Floyd B. Nagle, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 13,825, Feb. 24, 1970, now abandoned. This application Sept. 3, 1970, Ser. No. 69,441
Int. Cl. C08g 51/58; C08f 45/58
U.S. Cl. 260—2.5 AJ 14 Claims

The addition of a substituted 2-butene having the general formula



each X independently forming either the cis or trans isomer, is F, Cl, Br, I or H where not more than one X is H, each M independently is O or S, each Z independently is Cl, or Br, each A independently is an inert substituent, such as F, I, methyl, phenyl, hydroxy, methoxy, nitro, carboxy, acetoxy, cyano, amino or sulfo, n and m are integers of 1 to 5 provided that when $n=m=1$ each Z and X is Br and $M = O$ and provided that when one X is H then n and m are integers of 3 to 5, and i and j are integers of 0 to 2 where $i \leq n-1$ and $j \leq m-1$ to a resin of polypropylene or polyurethane makes the resultant resin fire retardant or, in greater concentrations, self-extinguishing according to Underwriters test class 2.

3,666,693

SEQUENTIAL GRAFT COPOLYMERIZATION OF ACID AND BASIC MONOMERS ONTO A PERHALOGENATED OLEFIN POLYMER

Adolphe Chapiro, and Anna-Maria Jendrychowska-Bonamour, both of Bellevue, France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Feb. 17, 1969, Ser. No. 799,996
Int. Cl. C08f 15/40
U.S. Cl. 260—2.5 R 6 Claims

Improved process of producing semipermeable membranes by graft copolymerization, wherein a perhalogenated olefin polymer substrate has grafted thereonto copolymers having acid and basic groups respectively, where the grafting of acid and basic monomers is carried out sequentially, where the first grafted group is neutralized before the second group is grafted onto the substrate, and where substantially all pendant acid and basic functions are neutralized after grafting has been completed.

3,666,694

EMULSIFIABLE PHENOLIC RESIN COMPRISING A RESOLE AND A SOLUBLE PROTEIN

Woodrow Hayes Ingram, II, Hampden, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 7,197, Jan. 30, 1970, now abandoned. This application May 5, 1971, Ser. No. 140,554
Int. Cl. C08g 37/16, 37/18, 37/20
U.S. Cl. 260—7 15 Claims

An emulsifiable phenol-formaldehyde resole resin system and emulsions prepared therefrom which exhibit improved stability. The thermoset resin products prepared from these emulsions also display improved water resistance.

3,666,695

EPOXY RESIN ADHESIVE CONTAINING A POLYMERIC FATTY-AMIDO AMINE AND MONOMERIC FATTY-AMIDO AMINE MIXTURE AS THE CURING AGENT

George A. Jachimowicz, Edina; Mark A. Minatelli, Minneapolis, and Harold M. Preston, New Brighton, all of Minn., assignors to General Mills Chemicals, Inc.

Filed Oct. 6, 1970, Ser. No. 78,609
Int. Cl. C08g 30/14
U.S. Cl. 260—18 PN 10 Claims

An epoxy resin system useful in aqueous form and particularly useful in forming carpet-like articles, in which the epoxy resin system when cured serves to bond fibrous materials to a variety of substrates. The system is particularly useful in bonding various fibers, natural and synthetic, to vinyl based substrates, e.g., vinyl plastisols, to which adhesion in the past has been poor. The system comprises an epoxy component and a liquid amine curing agent component which is a mixture of a monomeric fatty acid amido-amine and a polymeric fat acid amido-amine.

3,666,696

COATING COMPOSITIONS COMPRISING THE REACTION PRODUCT OF AN ORGANIC POLYISOCYANATE MODIFIED WITH A MONOHYDRIC ALCOHOL AND AN OIL MODIFIED ROSINOUS MATERIAL

James Moore, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 11, 1970, Ser. No. 45,563
Claims priority, application Great Britain, June 6, 1969, 31,254/69
Int. Cl. C08g 17/16
U.S. Cl. 260—18 TN 8 Claims

Two-pack surface-coating compositions comprising in admixture (A) an essentially di-isocyanate product which is obtained by the reaction of a polyisocyanate of functionality of at least 3 or a mixture thereof with other polyisocyanates and a monohydric alcohol of molecular weight at least 70, and (B) the reaction product of an oil selected from castor oil, hydrogenated castor oil and mixtures thereof and a hydroxyl group-containing product based on rosin.

3,666,697

METHOD FOR PRODUCING SHAPED PLASTIC ARTICLES

Casimir C. Peloza, Rosemount, Minn., assignor to Ashland Oil Inc., Houston, Tex.

Filed Mar. 11, 1970, Ser. No. 18,765
Int. Cl. C08f 21/04; C08g 17/16
U.S. Cl. 260—22 CB 13 Claims

A method is disclosed for producing shaped plastic articles in the form of a solid water-in-oil emulsion wherein the water phase exists as discrete colloidal-size water droplets dispersed in a continuous oil phase consisting of the thermoset polymerization product of an essentially linear unsaturated polyester and a vinyl monomer. The foremost utility of the disclosed method is that it provides shaped articles whose surfaces are substantially free of irregularities in the nature of pimples.

3,666,698

WATER-SOLUBLE POLYESTER RESIN CONTAINING PHENYLINDAN DICARBOXYLIC ACID

Robert R. Harris, Burnham, Ill., and Carl H. Kressman, Long Beach, Calif., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Dec. 14, 1970, Ser. No. 98,038
Int. Cl. C09d 3/64, 5/14
U.S. Cl. 260—22 M 4 Claims

Alkyd resins which contain critical amounts of tall oil fatty acid and phenylindane dicarboxylic acid (PIDA) in combination with trimetllitic anhydride and trimethylol propane gives a resin which is dispersible in water, yet has exceptionally high mildew resistance, strength, hydrolytic stability, chemical resistance, film hardness, and excellent properties of fast drying and adhesion. The resin may be deposited in an electrophoresis bath if it is first solubilized by the addition of an alkaline material. The resin is self-curing and dries in air to a hard, durable, glossy film which does not require to be baked.

3,666,699

COMPOSITIONS OF POLYSTYRENE AND POLYETHYLENE WAXES

Thomas E. Nixon; John A. Barber, and Floyd B. Nagle, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Original application Mar. 8, 1968, Ser. No. 711,509, now Patent No. 3,544,552. Divided and this application Aug. 6, 1970, Ser. No. 61,824
Int. Cl. C08f 33/02
U.S. Cl. 260—23 S 3 Claims

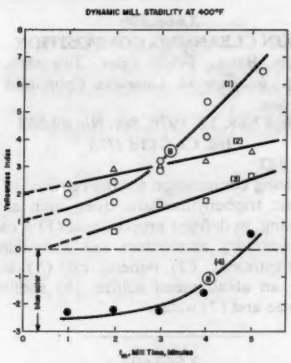
This invention comprises compositions of polystyrene and polyethylene waxes, together with a lubricant or mold release agent, which compositions are suitable for making fragile molded articles useful as targets in the practice of skeet shooting.

3,666,700

POLYVINYL CHLORIDE COMPOSITION

Laurence F. King, Mooretown, and William Taylor, Sarnia, Ontario, both of Canada, assignors to Esso Research and Engineering Company

Filed Dec. 3, 1970, Ser. No. 94,832
Int. Cl. C08c 11/70, 11/66
U.S. Cl. 260—28.5 D 11 Claims



A polyvinyl chloride composition is prepared from a polyvinyl chloride resin having a weight average molecular weight of about 40,000 to about 90,000 in combination with an organophosphite chelator, a thio-organotin stabilizer, and a lubricant system consisting of a white oil and a microcrystalline petroleum wax. This composition gives a product which is characterized by easy processability, high clarity, and greatly reduced yellowing tendency; thus, minimizing or eliminating the need for a color masking agent (e.g., a blue or violet toner).

3,666,701

COPOLYMER BONDING AGENT

Oren L. Marrs, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 1, 1970, Ser. No. 68,771
Int. Cl. C09j 3/26
U.S. Cl. 260—27 9 Claims

Copolymer bonding agents comprising in combination resinous tackifiers, organic solvents, and a conjugated dienelactone block copolymer, applied as a solution or dispersion to provide a pressure sensitive adhesive, a solvent cement, and a laminating adhesive.

3,666,702

INHIBITION OF CRYSTALLIZATION OF LIQUID EPOXY RESINS

John C. Haugh, Coon Rapids, Minn., assignor to General Mills Chemicals, Inc.

Filed Oct. 12, 1970, Ser. No. 80,199
Int. Cl. C08g 53/00, 30/14
U.S. Cl. 260—29.2 EP 7 Claims

Liquid epoxy resins are stabilized against crystallization at ambient temperatures by combining therewith a crystallization inhibiting amount of 2-amino-2-ethyl-1,3-propanediol.

3,666,703

FOUNDRY SAND COMPOSITION FOR CORES AND MOLDS

Takao Murata, Yaizu, and Atsushi Kudo, Fujieda, both of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed May 13, 1969, Ser. No. 824,253
Int. Cl. C08g 51/24, 5/06
U.S. Cl. 260—29.3 9 Claims

In the production of foundry molds and cores, foundry sand grains are bound together with a binder composition comprising a mixture of (1) an aqueous phenolic resin prepared by reacting a mixture of phenol and formaldehyde in the range of 1:1.8 and 1:3.0, and optionally containing urea as a third component, and (2) cement such as Portland cement, alumina cement, magnesia cement and dolomite cement. Accelerators such as alkali metal carbonates, alkaline earth metal oxides and other metal oxides which are capable of forming coordinate bonds are also employed in the compositions. Molds and cores formed from the foregoing compositions are self-curing at room or ambient temperature in a short time.

3,666,704

PRODUCTION OF AQUEOUS DISPERSIONS OF POLYMERS OF OLEFINICALLY UNSATURATED MONOMERS

Hans-Georg Keppler, Weinheim, and Hermann Wesslau, Bad Duerkheim, both of Germany, assignors to Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine-land Rheinland-Pfalz, Germany

Filed Apr. 27, 1970, Ser. No. 32,371
Claims priority, application Germany, Apr. 30, 1969, P 19 21 946.6
Int. Cl. C08g 1/13
U.S. Cl. 260—29.6 WB 2 Claims

Production of aqueous polymer dispersions containing relatively large polymer particles by polymerizing olefinically unsaturated monomers (A) and, if desired, olefinically unsaturated monomers (A') in aqueous emulsion in the presence of conventional dispersing agents, catalysts and previously prepared emulsion polymers of olefinically unsaturated monomers carried out by adding, during the polymerization of the monomers (A) and, if present, (A') up to a point where 95 percent of said monomers have been converted, minor quantities of previously prepared emulsion polymers in the form of an aqueous dispersion, which emulsion polymers contain from 0.5 to 50 percent of their weight of polymerized units of olefinically unsaturated monomers (B) which when polymerized alone yield water-soluble homopolymers, the proportion of monomers (A') in admixture with the monomers (A) being at least 20 percent (based on the proportion of polymerized units of monomers (B) in the previously prepared emulsion polymer) less than the proportion of polymerized units of the monomers (B) in the previously prepared emulsion polymer.

3,666,705

PRODUCTION OF ALCOHOL-FREE VINYLAMIDINES

Hans Peter Panzer, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 1, 1970, Ser. No. 42,468
Int. Cl. C08f 45/24
U.S. Cl. 260—29.6 AN 14 Claims

A reaction mixture composed of an acrylonitrile polymer, a water-soluble alkylenepolyamine and a water-soluble alcohol on heating yields a solution of a poly-2-vinylimidazoline in the alcohol. The alcohol separates, usually as a supernatant layer, when the solution is acidified with an aqueous solution of a strong acid.

3,666,706

SUBSTITUTE FOR COAL DUST IN CASTING MOLDS AS LUSTROUS CARBON-FORMING ADDITIVE

Winfried Hespers, Bielefeld, Germany, assignor to Ravensberger Eisenhutte Reinshagen & Vogt, Bielefeld, Germany

Filed Nov. 6, 1969, Ser. No. 870,553
Claims priority, application Germany, Nov. 7, 1968, P 18 07 453.8; Oct. 17, 1969, P 19 52 357.0
Int. Cl. C08f 45/24
U.S. Cl. 260—29.6 XA 10 Claims

A non-foamed, unsubstituted hydrocarbon polymer in finely divided form, of particle size less than 0.3 mm in amounts of 0.5 to 3 percent provides the lustrous or glance carbon forming constituent in place of coal dusts in a foundry molding sand composition with 6 to 8 percent bentonite as binder.

3,666,707

SLURRY ADDITIVE FOR ABLATIVE WATER FIRE EXTINGUISHING SYSTEMS

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Turnpike, Mass.

Filed Feb. 20, 1970, Ser. No. 13,179
Int. Cl. C08g 51/42
U.S. Cl. 260—33.2 17 Claims

A shelf stable slurry for injection into ablative water fire extinguishing systems comprises a uniform suspension of polyacrylamide polymer gelling agent in a polyoxyalkylene vehicle containing a stabilizing amount of silica suspending agent.

3,666,708

METHOD FOR PREPARING STABLE POLYURETHANE SOLUTIONS

Yasuji Nakahara; Jukichi Ohmura, and Ryoji Horinaka, all of Fujishi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 13, 1970, Ser. No. 11,073
Claims priority, application Japan, Feb. 13, 1969, 44/10037
Int. Cl. C08g 22/16, 51/46, 53/00
U.S. Cl. 260—32.6 N 7 Claims

Method for producing a polyurethane solution which comprises mixing reactants of a prepolymer having terminal isocyanate groups a bifunctional chain-connecting agent having 2 hydrogen atoms capable of reacting with the isocyanate group and 0.5 – 10 mol percent of N,N-dialkylalkylene diamine per mol of the bifunctional chain connecting agent at room temperature and then subjecting the reaction mixture to heat-aging at a temperature of at least 70° C for at least 5 hours.

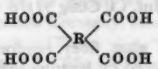
3,666,709

SOLVENT SOLUBLE AROMATIC POLYMIDES AND PRODUCTION THEREOF

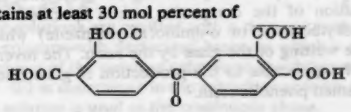
Munehiko Suzuki; Etsuo Hosokawa, both of Yokohama-shi; Misao Waki, Kawasaki-shi, and Masatada Fukushima, Yokohama-shi, all of Japan, assignors to Shawa Densen Denran Kabushiki Kaisha a/k/a Showa Electric Wire & Cable Co., Ltd., Kanagawa-ken, Japan

Filed Dec. 15, 1969, Ser. No. 885,140
Claims priority, application Japan, Dec. 14, 1968, 43/91760
Int. Cl. C08g 20/00, 5/44
U.S. Cl. 260—33.4 P 31 Claims

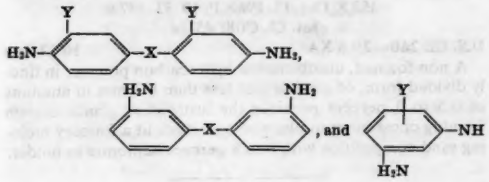
An aromatic tetracarboxylic acid which is representable by the general formula



and contains at least 30 mol percent of



and a diamine which is representable by the general formula $H_2N—R\Phi/NH_2$ and contains at least 30 mol percent of diamines representable by any of



are heated and caused to react in substantially equal mol quantities in a phenolic solvent or in an aprotic organic polar solvent thereby to produce a new linear aromatic polyimide which is soluble in organic solvents and has high stability for preservation in the form of solutions such as varnishes. This method does not require a step of thoroughly dehydrating the aromatic tetracarbosylic acid component prior to the reaction.

3,666,710

NON-AQUEOUS DISPERSIONS

Joseph M. Makhlouf, Mars; Roger M. Christenson, Gibsonia, and Andrew Halcoussis, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 8, 1969, Ser. No. 856,173

Int. Cl. C08f *45/28, 47/20;* C08j *1/46*

U.S. Cl. 260—33.6 UA **10 Claims**

A non-aqueous dispersion of polymer particles is formed by polymerizing at least one ethylenically unsaturated monomer in a dispersing liquid in the presence of a polymerizable ethylenically unsaturated carboxylic acid, an imine, and a dispersion stabilizer which is a branched copolymer having two types of polymeric components of which one type is solvated by the dispersing liquid and the other type is an anchor polymer of different polarity to the first type and being relatively non-solvatable by the dispersing liquid and being capable of being anchored to the polymerized particles of the ethylenically unsaturated monomer and said anchor polymer containing pendant groups capable of copolymerizing with ethylenically unsaturated monomers. The resulting dispersion is stable where large amounts of active or coalescing solvents are added and a coating formed from the dispersion has excellent adhesion to many substrates.

3,666,711

PRODUCTION OF FIBER REINFORCED RESIN COMPOSITES

Carolyn Ethel Mary Morris, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 10, 1970, Ser. No. 18,302

Claims priority, application Great Britain, Mar. 14, 1969, 13,576/69

Int. Cl. C08g *51/10*

U.S. Cl. 260—38 **8 Claims**

The properties of glass fiber reinforced phenolic resin composites are improved by treating the glass fiber prior to the formation of the composite with a specified alcohol, ketone, alkylbenzene or o-amino(alkylbenzene) which improves the wetting of the glass by the resin. The invention is particularly applicable to the production of glass fiber reinforced foamed phenolic resin.

3,666,712

FLAME RETARDANT POLYMETHYL METHACRYLATE COMPOSITIONS

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation-in-part of application Ser. No. 463, Jan. 2, 1970, now abandoned. This application Apr. 6, 1970, Ser. No. 26,050

Int. Cl. C09k *3/28*

U.S. Cl. 260—45.7 P **5 Claims**

Self-extinguishing homo- and copolymers of methyl methacrylate (MMA) are prepared by the intimate admixture of the latter polymers with a specified 2,3-dibromopropyl acid phosphate ester. The thus treated polymers display a high degree of flame retardance without any diminution of their clarity or hardness and they may be safely employed in any application requiring their possible exposure to fire.

3,666,713

ULTRAVIOLET LIGHT INHIBITORS

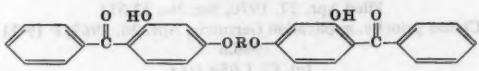
Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original application Nov. 24, 1967, Ser. No. 685,329, now Patent No. 3,580,927. Divided and this application Aug. 18, 1970, Ser. No. 64,806

Int. Cl. C08f *45/58;* C08g *51/58*

U.S. Cl. 260—45.8 A **6 Claims**

Ultraviolet light absorbers with extremely low volatility are prepared by reacting 2,4-dihydroxybenzophenone and organic dihalides or diepoxides. The resultant compounds have the general formula



where R is a divalent organic radical. These compounds may be used as carriers for dye, permitting the internal coloring of polyester films and fibers.

3,666,714

POLYACETALS STABILIZED WITH SECONDARY ALKALI METAL PHOSPHATES

Karl-Heinz Hafner, and Harald Cherdron, both of c/o Farbwerke Hoechst AG, Frankfurt am Main, Germany

Filed Nov. 4, 1969, Ser. No. 874,018

Claims priority, application Germany, Nov. 15, 1968, P 18 09 059.0

Int. Cl. C08g *51/56*

U.S. Cl. 260—45.7 P **7 Claims**

Polyacetals comprising oxymethylene and oxyalkylene units in the main chain of the macromolecules are stabilized against the action of heat and oxygen by means of secondary alkali metal phosphates. Thermoplastic molding compositions prepared from the stabilized polyacetals are suitable for the manufacture of finished and semi-finished products, for example molded articles, household utensils, and parts of machines.

3,666,715

STABILIZED COMPOSITION COMPRISING α-OLEFIN POLYMERS AND MELAMINE

Abraham Kutner, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser. No. 625,308, Mar. 23, 1967, now abandoned. This application July 8, 1970, Ser. No. 53,275

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.8 N **6 Claims**

The resistance of α-olefin polymers to copper induced oxidation is improved by adding thereto 0.01 to 2 percent

melamine along with conventional antioxidants and light stabilizers. The efficiency of the melamine as a stabilizer is improved if the particle size is below about 55μ.

3,666,716

DERIVATIVES OF DIPHENYLAMINE AND THE PHENYLNAPHTHYLAMINES AS ANTIOXIDANTS AND AS SYNERGISTS WITH DIALKYL 3,3'-THIODIPROPIONATES

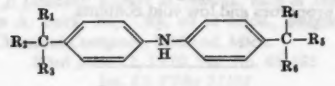
Edward L. Wheeler, Woodbury, Conn., assignor to Uniroyal Inc.

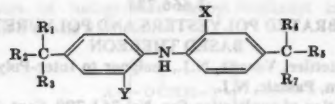
Original application Apr. 7, 1966, Ser. No. 540,817, now Patent No. 3,505,225, dated Apr. 7, 1970. Divided and this application Jan. 12, 1970, Ser. No. 2,382

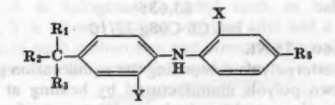
Int. Cl. C08f 45/60

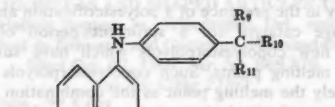
U.S. Cl. 260—45.9 R 5 Claims

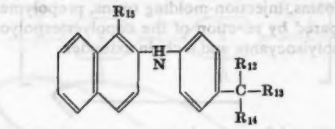
Derivatives of diphenylamine or phenylnaphthylamine of the types











where R_1, R_9 and R_{12} are phenyl or p-tolyl groups and the remaining R's, X and Y may be alkyl or various other substituents, are useful antioxidants for lubricating oils or for various polymeric substrates (e.g. polypropylene) especially in combination with a dialkyl thiodipropionate. Typical antioxidants are 4,4'-bis-(alpha,alpha,p-trimethylbenzyl)diphenylamine made by reacting p,alpha-dimethylstyrene with diphenylamine, and N-(4-alpha,alpha-dimethylbenzylphenyl)-1-(alpha,alpha-dimethylbenzyl)-2-naphthylamine made by reacting alpha-methylstyrene with N-phenyl-2-naphthylamine.

3,666,717

POLYAMIDES STABILIZED WITH A PHOSPHINE

Geoffrey Spencer Davy, and Vincent Matthews, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 14, 1970, Ser. No. 28,499

Claims priority, application Great Britain, Apr. 15, 1969, 19,156/69

Int. Cl. C08g 51/56, 51/58, 51/60

U.S. Cl. 260—45.95 9 Claims

Synthetic linear polyamides which are stabilized against the degradative effect of heat by the incorporation therein of phosphine or of certain primary or secondary organophosphines, optionally together with a substituted phenolic or substituted diphenylamine antioxidant. These phosphines have a reduced adverse effect on the dispersion properties of titanium dioxide when used as a pigment in polyamides, compared with other phosphorus-containing stabilizers.

3,666,718

SILPHENYLENESILOXANE POLYMERS HAVING IN-CHAIN PERFLUOROALKYL GROUPS

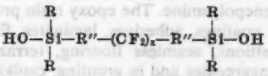
William J. Patterson, Madison, and Donald E. Morris, Huntsville, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 22, 1970, Ser. No. 100,774

Int. Cl. C08f 11/04

U.S. Cl. 260—46.5 P 5 Claims

Silphenylenesiloxane polymer having in-chain perfluoroalkyl groups is prepared by reacting a disilanol having the formula



where R is a monovalent hydrocarbon radical, R'' is an arylene group, and x is from two to eight with a diaminosilane which, when cured, produces a polymeric material resistant to hydrocarbon fuels and stable at elevated temperatures.

3,666,719

PROCESS FOR THE PURIFICATION OF POLYMER SOLUTIONS

Karl Morgenstern, Krefeld; Hermann Schnell, Krefeld-Uerdingen; Ludwig Bottenbruch, Krefeld-Boekum; Otto Court, Neuss; Hans-Helmut Schwarz, Krefeld-Bochum, and Hugo Vernaleken, Krefeld, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 24, 1970, Ser. No. 13,853

Claims priority, application Germany, Mar. 5, 1969, P 19 11 179.6

Int. Cl. C08g 17/13

U.S. Cl. 260—47 XA 5 Claims

Polymer solutions are purified with a detergent solution in pulsating columns with perforated bases, in which a proportion by volume of the polymer solution to the detergent solution of 0.1 is maintained in the extraction column and the detergent solution is used as the continuous phase.

3,666,720

VINYL CHLORIDE COPOLYMERS

Eric Nield, Waton-At-Stone, and John Brewster Rose, St. Albans, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of application Ser. No. 696,122, Jan. 8, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 374,181, June 10, 1964, now abandoned. This application Aug. 11, 1970, Ser. No. 63,011

Claims priority, application Great Britain, June 18, 1963, 24,223/63

Int. Cl. C08g *20/00*

U.S. Cl. 260—47 UA 7 Claims

Improved thermoplastic materials are provided which are polymeric products comprising from 99 to 1 percent by weight of vinyl chloride units, from 1 to 90 percent by weight of N-aryl maleimide units and from 0 to 49 percent by weight of units derived from at least one other copolymerisable ethylenically unsaturated compound. Very interesting materials are obtained when the said compound comprises not more than 20 percent by weight of the polymeric product. The preferred products contain from 60 to 99 percent by weight of vinyl chloride residues, from 1 to 40 percent by weight of N-aryl maleimide residues and 0 to 20 percent by weight of residues derived from the other monoethylenically unsaturated compound.

3,666,721

POLYAMINE AND HYDROCARBON SULFONIC ACID ACCELERATOR COMBINATION FOR EPOXY CURING

Norman Bell Godfrey, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Oct. 13, 1970, Ser. No. 80,510

Int. Cl. C08f *30/14*

U.S. Cl. 260—47 EC 9 Claims

An accelerator combination of a polyamine and an organic sulfonic acid is synergistic for accelerating the cure of a polyglycidyl ether of a polyhydric phenol cured with a polyoxypropylenepolyamine. The epoxy resin product is useful in castings, coatings, adhesives, laminates, filament reinforced compositions, seamless flooring, terrazzo flooring, crushed-stone aggregates and in grouting, caulking and sealing compositions.

3,666,722

ACRYLONITRILE COPOLYMERS CONTAINING SULFONIC ACID GROUPS

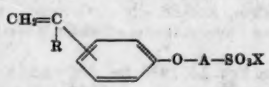
Jeno Szita, Dormagen; Ulrich Bahr, Opladen-Luetzenkirchen; Herbert Marzolph, and Gunther Nischk, both of Dormagen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of application Ser. No. 654,351, July 19, 1967, now abandoned. This application Mar. 25, 1971, Ser. No. 128,179

Int. Cl. C08f *19/00*

U.S. Cl. 260—49 5 Claims

This invention relates to acrylonitrile copolymers containing at least 50 percent by weight of acrylonitrile and up to 10 percent by weight of an ethylenically insaturated sulfonic acid compound of the formula



wherein R represents a hydrogen atom or a methyl group, A represents an alkylene radical and X represents hydrogen, ammonium, an alkali or an organic ammonium cation, the balance being one or more additional copolymerizable monomers, and to a process for their production by copolymerizing said monomers in an aqueous medium with a redox catalyst system or in an organic polar solvent with a radical catalyst.

The copolymers show a high degree of whiteness, outstanding thermal stability and excellent textile properties together with a high affinity for basic dyes.

3,666,723

POLYIMIDES FROM 2,6-DIAMINO-S-TRIAZINES AND DIANHYDRIDES

Raymond J. Kray, Berkeley Heights, N.J., and Roland A. E. Winter, Armonk, N.Y., assignors to Ciba-Geigy Corporation

Filed Aug. 1, 1969, Ser. No. 889,017

Int. Cl. C08g *20/32*

U.S. Cl. 260—65 7 Claims

Triazine-based polyimides are prepared by first reacting dianhydrides with s-triazine compounds containing at least two primary aromatic, aliphatic or cycloaliphatic amino groups to give triazine-based polyamic acids which, on curing, yield the polyimides. The polyamic acids are soluble in organic solvents or ammonium hydroxide, the latter yielding the aqueous solutions. From said organic or aqueous solutions useful fibers, films, adhesives, coatings and composites can be prepared. The triazine-based polyimides possess high temperature oxidative stability, good mechanical properties and electrical properties and low void contents.

3,666,724

EQUILIBRATED POLYESTERS AND POLYURETHANES BASED THEREON

Fritz Hostettler, Verona, N.J., assignor to Inter-Polymer Corporation, Passaic, N.J.

Continuation of application Ser. No. 761,790, Sept. 23, 1968, now abandoned. This application Aug. 13, 1970, Ser. No. 63,635

Int. Cl. C08g *22/10*

U.S. Cl. 260—75 NK 11 Claims

Copolyesterpolyols comprising the equilibration product of at least two polyols manufactured by heating at least two high molecular weight polyols, at least one of which is a polyester polyol, to a temperature of 150° to about 300° C., preferably in the presence of a polyesterification and/or ester interchange catalyst, for a sufficient period of time to produce new copolyesterpolyols which have substantially constant melting points. Such copolyesterpolyols have approximately the melting point as the combination of the ingredients synthesized by a normal copolyesterification technique. Also provided are polyurethane products derived from the copolyesterpolyols comprising solid urethane elastomers, microcellular elastomers, flexible and rigid polyurethane foams, injection-molding resins, prepolymers and the like, prepared by reaction of the copolyesterpolyols with an organic polyisocyante and a chain extender.

3,666,725

TRIS(ISOCYANATOTOLYL) ISOCYANURATE-TOLYLENE DIISOCYANATE COMPLEXES

Carl Francis Irwin, New Castle, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 26, 1970, Ser. No. 84,150

Int. Cl. C08g *22/18, 22/28*

U.S. Cl. 260—75 NT 10 Claims

An aromatic polyisocyanate which is a molecular complex consisting of one molecule of tris(isocyanatotolyl) isocyanurate associated with two molecules of tolylene diisocyanate. The complex, which is a free-flowing crystalline powder low in toxicity, reacts with active-hydrogen containing compounds to form polyurethane coatings, foams, elastomers, etc. Such polyurethane coatings have particularly outstanding resistance to weather exposure and solvent attack.

3,666,726

POLYMERS WHICH CONTAIN POLYAMIDE, UREA AND/OR URETHANE GROUPS AND PROCESS FOR PREPARING SAME

Gerhard Grogler, and Gunter Oertel, Leverkusen/Cologne, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Germany

Filed July 2, 1970, Ser. No. 52,066
Claims priority, application Germany, July 12, 1969, P 19 35 485.9
Int. Cl. C08g *22/02, 22/04*
U.S. Cl. 260—77.5 CH 8 Claims

Polymers containing polyamide, urea and/or urethane groups are obtained by a process which comprises the polyaddition of aliphatic or aromatic polyisocyanates with polyfunctional aminocrotonic acid esters, the substitutents of which on the nitrogen containing additional hydroxyl or amino groups.

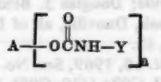
3,666,727

POLYMERS OF HALOGEN CONTAINING N-ALKENYL CARBAMATES

Richard J. Dolinski; Robert M. Nowak, both of Midland, and George A. Burk, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 22, 1970, Ser. No. 48,485
Int. Cl. C08g *22/04*
U.S. Cl. 260—77.5 BB 14 Claims

Polymers of halogenated carbyl-N-alkenyl carbamates represented by the formula:



wherein A is halogenated carbyl such as haloalkyl or haloaryl, Y is alkenyl such as vinyl or allyl and *a* is 1 or 2. Polymers of such carbamates and other ethylenically unsaturated monomers are generally found to be self-extinguishing.

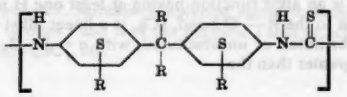
3,666,728

POLYTHIOUREAS AND SHAPED ARTICLES THEREOF

Willard Hallam Bonner, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1969, Ser. No. 869,870
Int. Cl. C08g *22/02*
U.S. Cl. 260—77.5 CH 7 Claims

Homo- and co-polythioureas having recurring units of the formula:



wherein R is hydrogen or methyl, are useful in the preparation of shaped articles (particularly fibers).

3,666,729

PLATING RESIST SOLUTION

Kim Ritchie, Cave Creek, and Yvonne Cecile Malkiewicz, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed July 2, 1970, Ser. No. 52,074
Int. Cl. C08f *3/60*
U.S. Cl. 260—78.4 EP 7 Claims

A catalyst-free, solvent-free plating resist solution consisting of a diallyl phthalate prepolymer having a molecular weight of about 4900 and a liquid epoxy compound such as 1, 2-epoxy ethylbenzene is disclosed. The plating resist solution contains about 0.1 to 3 parts by weight of the diallyl phthalate prepolymer to one part by weight of the liquid epoxy compound.

3,666,730

OIL-SOLUBLE INTERPOLYMERS OF N-VINYLTHIOPYRROLIDONES

Lester E. Coleman, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Original application July 5, 1968, Ser. No. 742,517, now Patent No. 3,519,565, which is a continuation-in-part of application Ser. No. 668,958, Sept. 19, 1967, now abandoned. Divided and this application Feb. 10, 1970, Ser. No. 14,887
Int. Cl. C08f *19/00, 41/00*
U.S. Cl. 260—78.5 B 7 Claims

N-Vinylthiopyrrolidone, and its lower alkyl-substituted homologs, are interpolymerized with polymerizable alkyl (C, or greater) carboxylates and (optionally) other oxygen-containing monomers to produce oil-soluble polymers. These polymers are useful in lubricating oils as viscosity index improvers, dispersants and oxidation inhibitors.

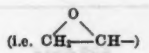
3,666,731

POLYAMIDE FILAMENTS CONTAINING HIGH VISCOSITY ANTISTATIC AGENTS

Lawrence W. Crovatt, Jr., Gulf Breeze, and Ullman C. Garrett, Jr., Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 13, 1970, Ser. No. 63,662
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 S 7 Claims

Static-resistant polyamide fibers are produced by dispersing from 0.1 to 20 percent by weight of a modified polyalkoxylated hydrogenated castor oil (castor wax) into the polyamide melt prior to filament formation. The modified castor wax is the addition product of castor wax and a diepoxide compound having two ethoxyline groups



as terminal groups. The modified castor wax has a higher melt viscosity than the corresponding unmodified castor wax which enables better dispersion thereof in the polyamide melt. As a result, polyamide fibers containing the modified castor wax are more easily processed and are of higher quality.

3,666,732

ETHYLENICALLY UNSATURATED DERIVATIVES OF 4-AMINOBENZOIC ACID AND POLYMERS PREPARED THEREFROM

Martin Skoultchi, Somerset, and Eric A. Meier, North Brunswick, both of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Filed Aug. 17, 1970, Ser. No. 64,574
Int. Cl. C08f *19/00, 19/12*
U.S. Cl. 260—78.5 BB 5 Claims

Ethylenically unsaturated derivatives of 4-aminobenzoic acid are prepared by a novel method involving the reaction under controlled conditions of 4-aminobenzoic acid and various derivatives thereof with allyl chloride. The resulting monomers may, thereafter, be copolymerized with a wide variety of conventional ethylenically unsaturated, i.e., vinyl, monomers. The monomeric derivatives as well as the copolymers prepared therefrom are ultra-violet absorbers in the 280–320 millimicrons range and find a particular utility as a sun-screen agent in suntan formulations.

3,666,733

WATER INSOLUBLE HYDROPHILIC POLYMERS OF ACRYLAMIDE POLYMER

Roger Epton, Wolverhampton, England, assignor to Koch-Light Laboratories Limited, Colnbrook Buckinghamshire, England

Filed Mar. 16, 1970, Ser. No. 20,021
Claims priority, application Great Britain, Mar. 19, 1969, 14,536/69
Int. Cl. C08f *15/00, 27/06;* C08h *19/02*
U.S. Cl. 260—80.3 N 2 Claims

This invention relates to hydrophilic water insoluble polymers, their preparation and the attachment of enzyme molecules to said polymers to render said enzymes water insoluble. The polymers comprise chains having attached thereto repeating primary amide side groupings which make said polymer hydrophilic and other repeating functional side groupings at least some of which are either acid hydrazide groupings or aromatic ammo groupings. These chains of the polymers have been cross-linked so as to make the polymer water insoluble by using bisacrylamides as a comonomer.

3,666,734

COPOLYMERS OF VINYL CHLORIDE AND TERPENES

Philippe Lalet, Orthez, and Guy Tsouladze, Paris, both of France, assignors to Societe Anonyme dite: Societe Nationale Des Petroles D'Aquitaine, Courbevoie, France

Filed Sept. 16, 1969, Ser. No. 858,535
Claims priority, application France, Sept. 18, 1968, 166677
Int. Cl. C08f *3/00*
U.S. Cl. 260—87.5 D 7 Claims

New vinyl resins of improved characteristics are prepared by polymerizing vinyl chloride in the presence of bicyclic terpenes.

3,666,735

PROCESS FOR IMPROVING PLASTICIZER ABSORPTION OF POLYVINYL HALIDES

Constantine Rosis, 35 Yorktown Rd., West Boylston, Mass., assignor to Borden Inc., New York, N.Y.

Filed Sept. 4, 1968, Ser. No. 757,486
Int. Cl. C08f *3/22, 1/11, 1/84*
U.S. Cl. 260—87.5 R 6 Claims

This invention relates to a method for improving the plasticizer absorption qualities of a polyvinyl halide. More particularly, this invention relates to a method as aforesaid wherein a monomeric vinyl halide is polymerized in suspension in the presence of a mineral oil having a boiling point above about 200° C.

3,666,736

LOW DENSITY ETHYLENE-BUTENE COPOLYMERS

John P. Hogan, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Mar. 24, 1969, Ser. No. 809,936
Int. Cl. C08f *15/04*
U.S. Cl. 260—88.2 R 3 Claims

Low density ethylene-butene-1 copolymers which are highly resistant to environmental stress cracking, characterized by freedom from surface stickiness, and have a ratio of weight average to number average molecular weight within the range of 6 to 20.

3,666,737

METHOD AND PROCESS OF PREPARING IMPROVED POLYETHERS

Joginder Lal, Cuyahoga Falls, and Donald E. Heppert, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 731,688, May 20, 1968, now abandoned, which is a continuation of application Ser. No. 312,315, Sept. 30, 1963, now abandoned, which is a continuation-in-part of application Ser. No. 124,015, July 14, 1961, now Patent No. 3,268,472. This application Aug. 6, 1970, Ser. No. 61,795
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 A 7 Claims

A composition of matter prepared by mixing a polyhydrocarbon ether formed by the polymerization of alkylene oxides containing from two to four carbon atoms and having a molecular weight of at least 15,000 and containing two to four carbon atoms in the divalent radical between adjacent ether oxygen atoms with a polymer of a 1-olefin containing from two to eight carbon atoms and having a molecular weight of at least about 280 and containing from about 0.2 to about 5 percent by weight of sulfur and from about 0.5 to about 10 percent by weight of a ditertiary peroxide and curing the mixture.

3,666,738

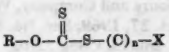
PREPARATION OF UNSATURATED COMPOUNDS BY HYDROLYSIS OF XANTHATE-LEWIS ACID COMPLEXES

Noel I. Burke, Danville; Douglas J. Bridgeford, Champaign, and Albin F. Turbak, Danville, all of Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Sept. 10, 1969, Ser. No. 856,821
Int. Cl. C07c *1/20;* C08b *29/00*
U.S. Cl. 260—91.3 VA 12 Claims

Simple and complex unsaturated compounds are prepared by decomposition of certain xanthate ester - Lewis acid complexes.

Xanthate esters of the form:



where R is an alkyl function having at least one H in a position alpha to the R — O bond, $(C)_n$ is a linear alkyl function either substituted or unsubstituted, with $n = 1 - 3$, X has a basicity greater than the

function and comprises a C or S containing functional group having at least one double or triple bond to a hetero atom, the functional group being connected to $(C)_n$ through C or S; are reacted with Lewis acids, either neat or in non-protonic non-aqueous solvents, to yield a Lewis acid complex of the esters. The Lewis acid - xanthate ester complex is decomposed by admixture with water or a protonic non-aqueous solvent, e.g. methanol, ethanol, etc., glycol, cellosolve, liquid ammonia, lower alkyl primary or secondary amines, aniline, etc., to yield an unsaturated derivative of R.

3,666,739

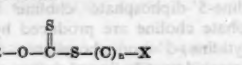
PREPARATION OF UNSATURATED COMPOUNDS BY XANTHATE DECOMPOSITION

Noel I. Burke, Danville; Douglas J. Bridgeford, Champaign, and Albin F. Turbak, Danville, all of Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Sept. 10, 1969, Ser. No. 856,813
Int. Cl. C08f 3/34, 23/00, 27/00
U.S. Cl. 260—91.3 VA 9 Claims

Simple and complex unsaturated compounds are prepared by decomposition of certain xanthate esters,

Xanthate esters of the form:



where R is an alkyl function having at least one H in a position alpha to the R — O bond, $(C)_n$ is a linear alkyl function either substituted or unsubstituted, with $n = 1 - 3$, X has a basicity greater than the

function and comprises a C or S containing functional group having at least one double or triple bond to a hetero atom, the functional group being connected to $(C)_n$ through C or S; will decompose upon heating in water or in a protonated non-aqueous solvent, e.g. methanol, ethanol, etc., glycol, cellosolve, liquid ammonia, pyridine, lower alkyl amines, aniline, etc., to yield an unsaturated derivative of R.

3,666,740

METHOD OF PRODUCING HIGH MOLECULAR POLYALLYL ALCOHOL

Valentin Alexeevich Kargin, ulitsa Galdara, 7, kv. 4; Lev Solomonovich Polak, Jugo-Zapad, kvartal 42a, 15, kv. 22; Viktor Alexandrovich Kabanov, Karetny ryad, 5/9, kv. 21; Vitaly Pavlovich Zubov, Rostovskaya naberezhnaya, 5, kv. 200, and Valentina Fedorovna Pankova, Daev pereulok, 6, kv. 15, all of Moscow, U.S.S.R.

Filed Aug. 14, 1969, Ser. No. 850,232
Int. Cl. C08f 1/80, 3/36
U.S. Cl. 260—91.3 R 16 Claims

A method of producing high-molecular weight polyallyl alcohol by polymerizing allyl alcohol in the presence of an inorganic complexing agent that forms a coordination bond with the functional group of the monomer under the effect of a radical initiator. Suitable complexing agents include salts of metals of Groups I and II of the Periodic Table or acids, e.g., HCl HNO_3, H_2SO_4, etc.

3,666,741

ELECTRICALLY CONDUCTIVE FLUOROCARBON POLYMER

Harold F. Leibecki, Parma, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Continuation-in-part of application Ser. No. 631,847, Apr. 17, 1967, now abandoned. This application Jan. 22, 1970, Ser. No. 5,114
Int. Cl. C08f 3/24, 3/26, 3/28
U.S. Cl. 260—92.1 7 Claims

Fluorocarbon polymers are impregnated with rhenium or molybdenum by immersion in liquid rhenium hexafluoride or molybdenum hexafluoride. The rhenium and molybdenum fluoride compounds are then hydrolyzed to form conductive oxides. The impregnated polymer is electrically conductive.

3,666,742

POLYMERIZATION OF CYCLIC OLEFINS CONTAINING TWELVE CARBON ATOMS

Nissim Calderon, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of application Ser. No. 785,032, Dec. 10, 1968, which is a continuation of application Ser. No. 477,035, Aug. 3, 1965, which is a continuation-in-part of application Ser. No. 448,872, Apr. 16, 1965. This application Dec. 4, 1970, Ser. No. 95,360
Int. Cl. C08f 7/02
U.S. Cl. 260—93.1 4 Claims

This invention relates to polymers derived from the ring opening polymerization of unsaturated alicyclic compounds containing at least one alicyclic ring, said ring containing 12 carbon atoms and having two or three nonconjugated carbon-to-carbon double bonds in the cyclic ring. Methods for their preparation are also disclosed.

3,666,743

POLYMERIZATION OF 1-OLEFINS WITH TETRAKIS(BICYCLOHEPTYL)CHROMIUM COMPOUNDS AS CATALYSTS

Barton K. Bower, Newark, and Wendell P. Long, Wilmington, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 2, 1971, Ser. No. 112,016
Int. Cl. C08f 1/16, 1/42, 15/40
U.S. Cl. 260—93.7 17 Claims

Tetrakis(1-bicycloheptyl)chromium compounds are catalysts for the polymerization of 1-olefins when activated by the addition of an organometallic compound and/or exposure to light. The polymerization process can be carried out by using a solution of the chromium compound or by extending the chromium compound on a solid support such as silica.

3,666,744

LAMINATING WAX

Ernest P. Black, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Original application Apr. 12, 1968, Ser. No. 720,832, now Patent No. 3,626,019. Divided and this application Oct. 7, 1970, Ser. No. 78,941
Int. Cl. C08f 1/76
U.S. Cl. 260—94.9 R 2 Claims

Laminating wax of high adhesive characteristics especially useful in the production of intercalated products is obtained from telomer resulting from a telomerization employing pseudocumene as the telogen and ethylene as the taxogen, the reaction producing said telomer being hereinafter referred to as the telomerization of ethylene on pseudocumene.

3,666,745

PROCESS FOR POLYMERIZING OLEFINS

James V. Cavender, Jr., Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed May 28, 1970, Ser. No. 41,413
Int. Cl. C08f 1/56, 3/06
U.S. Cl. 260—94.9 C 5 Claims

Polyolefins with characteristics which make them particularly suitable for blowing into bottles are obtained by polymerizing olefins in contact with so-called Ziegler catalysts and employing as a modifying agent for the polymerization a mixture of hydrogen and acetylene.

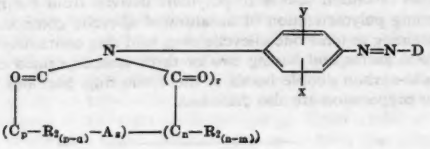
3,666,746

PYRROLIDONYLPHENYL AZO DYESTUFFS

Lester N. Stanley, Delmar, and Russell E. Farris, Jr., Elnora, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed June 25, 1969, Ser. No. 836,602
Int. Cl. C09b 29/08, 29/10, 29/38
U.S. Cl. 260—152 22 Claims

Dyes for dyeing hydrophobic fibers such as acrylics and polyesters of the formula:



and quaternized derivatives thereof wherein

R's are independently selected from hydrogen, halogen, hydroxy, alkyl, substituted alkyl, aryl, substituted aryl, cycloalkyl and the like;

A is 0, *N* or *S*;

n and *p* are integers from 0 to 15

n+*p* is at least 2;

z is an integer of 0 or 1;

r is an integer of 0 or 1;

n+*p*+*z*+*r* is at least 3;

m and *q* are the number of double bonds in the C_n and C_p moities;

x and *y* are selected from hydrogen, halogen, lower alkyl, lower alkoxy, sulfonic acid amide and substituted derivatives thereof, carboxylic acid amides and substituted derivatives thereof, lower alkylsulfonyl, cyano, carbalkoxy, nitro, and the like; and *D* is a coupling component which is free from solubilizing sulfonic acid and carboxylic acid groups.

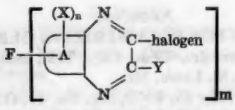
3,666,747

AZO DYESTUFFS

Edgar Siegel, Leverkusen, and Klaus Sasse, Cologne-Stammheim, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of application Ser. No. 171,269, Feb. 5, 1962, now abandoned. This application Nov. 13, 1968, Ser. No. 775,554
Int. Cl. C09b 62/24
U.S. Cl. 260—154 16 Claims

Fiber reactive dyestuffs for use on cellulose containing textile materials having the formula



wherein F is the radical of an organic dyestuff, A is a five- or six-membered isocyclic or heterocyclic ring, X is hydrogen or an organic substituent, Y is hydrogen, halogen or an organic radical, "halogen" is a halogen atom, *m* a whole number and *n* a whole number from 1 to 3.

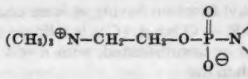
3,666,748

METHOD FOR PRODUCTION OF CYTIDINE (OR DEOXYCYTIDINE)-5'-DIPHOSPHATE CHOLINE AND INTERMEDIATES THEREFOR

Mikio Honjo, Takatsuki, and Yoshiyasu Furukawa, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan

Filed Dec. 17, 1968, Ser. No. 784,494
Claims priority, application Japan, Dec. 18, 1967, 42/81074; Mar. 5, 1968, 43/14166
Int. Cl. G07d 51/52
U.S. Cl. 260—211.5 R 3 Claims

Cytidine-5'-diphosphate choline and deoxycytidine-5'-diphosphate choline are produced by reacting cytidine (or deoxycytidine)-5'-monophosphate with a choline phosphoramidate. Choline phosphoramidates of the formula



wherein R_1 and R_2 represent hydrogen, a hydrocarbon residue having at most seven carbon atoms, or R_1 and R_2 taken together represent a five- or six-membered heterocyclic ring are prepared by reacting phosphorylcholine with an amine.

3,666,749

IRON DEXTRAN COMPLEX AND PROCESS FOR MAKING SAME

Jorgen de Musquiz Reumert, Gentofte; Ole Gylling-Pedersen, and Jose Bou Casals, both of Roskilde, all of Denmark, assignors to Aktieselskabet Rosco, Taastrupgardsveg, Taastrup, Denmark

Continuation-in-part of application Ser. No. 502,485, Oct. 22, 1965, now abandoned. This application Sept. 15, 1969, Ser. No. 858,105
Claims priority, application Denmark, Dec. 29, 1964, 6403/64
Int. Cl. C07c 47/18
U.S. Cl. 260—209 D 9 Claims

A method of making iron dextran complexes wherein ferric hydroxide is reacted with dextran or dextran glucosides, precipitating iron dextran into at least two fractions having different iron contents and subjecting one of the fractions of the iron dextran formed in the first complexing step to a second complexing step and precipitating the iron dextran into at least two fractions having different iron contents, separating and recovering the fraction having the higher iron content and recycling the fraction having the lower iron content.

3,666,750

HEMOSTATIC MATERIAL

Theodore S. Briskin, Beverly Hills, and Allen H. Remanick, Pasadena, both of Calif., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Dec. 15, 1969, Ser. No. 885,313
Int. Cl. A61l 15/00; C08b 15/02, 23/02
U.S. Cl. 260—212 6 Claims

A new and improved hemostatic material formed of an oxidized cellulosic material and method for its preparation wherein an oxidized cellulosic material is treated with a borohydride under alkaline conditions.

3,666,751

CATIONIC STARCH PRODUCT IN LIQUID FORM

Wadym Jarowenko, Plainfield, and Morton W. Rutenberg, N. Plainfield, both of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 811,649, Mar. 28, 1969, now abandoned. This application Feb. 27, 1970, Ser. No. 15,199
Int. Cl. C08b 19/06
U.S. Cl. 260—233.3 R 7 Claims

Novel liquid cationic starch derivatives and methods for their preparation are described. The derivatives, prepared by

reaction of starch with epichlorohydrin-ammonium hydroxide condensates, are useful as additives in the manufacture of paper wherein they increase the retention of inorganic pigments by the cellulose pulp and strengthen the resulting paper.

3,666,752

4,4-DIPHENYLHEXAHYDROAZEPINE COMPOUNDS

Henry Michael Holava, and Richard Anthony Partyka, both of Liverpool, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,919
Int. Cl. C07d *41/04, 41/06*
U.S. Cl. 260—239 B 7 Claims

4,4-Diphenylhexahydroazepine and derivatives thereof have been found to be useful antidepressant agents in the treatment of psychic depression in mammals. 4,4-Diphenylhexahydroazepine hydrochloride has been found to be particularly promising as it is characterized by a good therapeutic index.

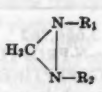
3,666,753

PROCEDURE FOR THE PREPARATION OF ALKYL SUBSTITUTED DIAZIRIDINES

Julien Mulders, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed May 29, 1969, Ser. No. 829,138
Claims priority, application Belgium, May 30, 1968, 59 054
Int. Cl. C07d *45/00, 49/02, 51/02*
U.S. Cl. 260—239 AA 10 Claims

Alkyl substituted diaziridines of the formula



in which R_1 and R_2 may be the same or different lower alkyl groups and in which R_1 and R_2 may also be jointed together to form a five- or six-membered ring, the carbon atoms of which ring may each be substituted with a methyl group are prepared by mixing formaldehyde, at least one alkyl amine and sodium hypochlorite in an aqueous alkaline medium and then extracting the aqueous mixture with an organic nitrogen containing solvent which is selected from the group which comprises nitrobenzene, aniline, γ-collidine, α-picoline, pyridine m-toluidine and quinoline and mixtures thereof to separate the resultant diaziridine from the aqueous mixture. The diaziridine product is obtained in high yield and purity after separation of the solvent.

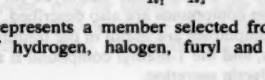
3,666,754

2-(5-NITROFURYL) NITRONE DERIVATIVES

Shinsaku Minami, Yamato-Kouriyama; Jun-Ichi Matsumoto, Osaka; Masanao Shimizu, Kobe, and Yoshiyuki Takase, Amagasaki, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 746,749, July 23, 1968, Original application Nov. 7, 1966, Ser. No. 592,265, now abandoned. Divided and this application July 9, 1970, Ser. No. 53,635
Claims priority, application Japan, Nov. 6, 1965, 40/68196; July 27, 1967, 42/48362; Dec. 23, 1969, 44/103620; 44/103621; Aug. 1, 1969, 44/61208; July 30, 1969, 44/60220
Int. Cl. C07d *5/30*
U.S. Cl. 260—240 32 Claims

Nitrone derivatives having antimicrobial activity comprising compounds having the formula:



wherein R_1 represents a member selected from the group consisting of hydrogen, halogen, furyl and phenyl substituents; R_2 represents a member selected from the group consisting of hydrogen, an alkyl having from about one to about four carbon atoms and phenyl; R_3 represents a member of the group consisting of phenyl and $A-(X)_n$, $A-(Y)_n$, and $A-(Z)_n$ in which A represents an alkyl radical having from about one to about six carbon atoms; X represents a member selected from the group consisting of hydrogen, hydroxyl, furyl, alkyl-sulfonyloxy having an alkyl group of from about one to about four carbon atoms and alkanoyl having an alkyl group of from about one to about three carbon atoms; Y represents a member selected from the group consisting of an arylsulfonyloxy radical, an alkyl-sulfonyloxy radical having from about one to about four carbon atoms, an aroyloxy radical, an alkoxycarbonyloxy radical having an alkyl group of from about one to about four carbon atoms and a carboxyalkanoyloxy radical having from about three to about six carbon atoms and Z represents a member selected from the group consisting of hydrogen and hydroxy, *n* is an integer of from about 1 to about 3, and *m* is an integer of from about 0 to about 1.

3,666,755

2-IMIDAZOLYLBICYCLO[2.2.2]OCTANES

Arthur F. Wagner, Princeton; Paul E. Wittreich, Tenafly, and Lewis H. Sarett, Skillman, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 26, 1970, Ser. No. 23,023
Int. Cl. C07d *49/36*
U.S. Cl. 260—240 F 43 Claims

Novel bicyclo[2.2.2]octanes and their process of preparation are described. These compounds exhibit inhibition of blood platelet aggregation.

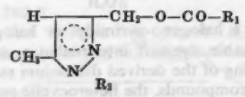
3,666,756

ESTERS OF 3-PYROZOLEMETHANOLS AND PROCESS FOR THEIR PREPARATIONS

Masataka Fukumura, Takarazuka-shi; Kozo Shimago, Minoo-shi; Shigeru Okano, Ibaragi-shi; Hiroshi Nakatani, Toyonaka-shi, and Kenji Hesaka, Minoo-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed June 16, 1969, Ser. No. 833,812
Claims priority, application Japan, June 20, 1968, 43/43081; 43/43082; Sept. 27, 1968, 43/70339; Feb. 4, 1969, 44/8658
Int. Cl. C07d *49/18*
U.S. Cl. 260—240 J 11 Claims

Novel pyrazole derivatives represented by the formula:



wherein R_1 represents an alkyl group, alkenyl group, aryl group, aryloxyalkyl group, aralkyl group, aralkenyl group, or a group containing a heterocyclic ring, and R_2 is a hydrogen atom or the same group as $-CO-R_1$. The pyrazole derivatives have a good antidiabetic action, and are prepared by diacylating 3-hydroxymethyl-5-methylpyrazole with an acylating agent represented by the general formula,

$$X-CO-R_1,$$

wherein X represents a halogen atom, a group of $-O-CO-R_1$ or a group of $-O-CO-O-R_3$, R_1 has the same meaning as defined above, and R_3 represents an alkyl group having one to four carbon atoms, and, if necessary, by subjecting the thus obtained diacylated pyrazole derivatives to partial hydrolysis or aminolysis.

3,666,757

DI-HYDRO-S-TRIAZINES

Patrick Mamalis, Reigate, England, assignor to Beecham Group Limited, Brentford, England

Filed Dec. 5, 1969, Ser. No. 882,724
Claims priority, application Great Britain, Dec. 20, 1968, 60,848/69
Int. Cl. C07d 55/20
U.S. Cl. 260—249.9 9 Claims

Anti-malarial and anti-bacterial compounds and compositions are provided which are N-substituted symmetrical dihydro triazines or salts represented by 4,6-diamino-1,2-dihydro-2,2-dimethyl-1-(2-ethoxy-5-chlorobenzyloxy)-1,3,5-triazine hydrochloride. The compounds can be prepared by reacting a substituted diguanide with a carbonyl compound in the presence of a strong acid and then salifying or acylating the reaction product.

3,666,758

PROCESS FOR THE PRODUCTION OF 2-ARYL-V-TRIAZOLES

Alfons Dorlars, and Otto Neuner, both of Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 14, 1968, Ser. No. 752,491
Claims priority, application Germany, Aug. 23, 1967, F 53 312
Int. Cl. C07d 55/02
U.S. Cl. 260—240 C 3 Claims

2-Aryl-v-triazoles are prepared by condensation of alpha-oximino-aryl-hydrazones or their O-acyl compounds at temperatures of about 100° to 210° C. in urea. The compounds are useful as dyestuff intermediates and as optical brighteners.

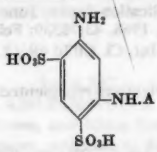
3,666,759

SUBSTITUTED ANILINO-S-TRIAZINES

Allen Crabtree, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of application Ser. No. 681,584, Nov. 8, 1967, now abandoned. This application Aug. 3, 1970, Ser. No. 60,616
Int. Cl. C07d 55/20, 55/18
U.S. Cl. 260—249.5 3 Claims

Compounds of the formula:



in which A is a halogeno-pyrimidyl or halogeno-*s*-triazinyl group are valuable dyestuff intermediates, notable for the speed of coupling of the derived diazonium salts. In the case of the triazine compounds, the heterocyclic nucleus can contain substituents other than halogen, notably methoxy, amino or sulphonated anilino and its common derivatives.

3,666,760

IODINATED 3-AMINOBENZAMIDES

James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 808,653, Mar. 19, 1969, now Patent No. 3,609,147 and a continuation-in-part of Ser. No. 715,583, Mar. 25, 1968, abandoned, Ser. No. 808,653 is a continuation-in-part of application Ser. No. 715,558, Mar. 25, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 550,614, May 17, 1966, now abandoned. This application Apr. 2, 1970, Ser. No. 25,262
Int. Cl. C07c 103/28
U.S. Cl. 260—247.2 A 3 Claims

3-Amino-2,4,6-triiodobenzoic acids optionally substituted in the 5-position by amino or carboxy or a derivative thereof react with dibasic acid anhydrides to give the corresponding cyclic imides (A), which can be hydrolyzed to the corresponding anilic acids (B). The latter can be further alkylated on the anilide nitrogen atom. Compounds A and B are useful as cholecystographic and urographic agents.

3,666,761

1-(4-PHENYL-1-PIPERIZINYL METHYL)-CYCLOPROPA[A]CYCLOPROP[A]INDENES

William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed July 16, 1969, Ser. No. 842,354
Int. Cl. C07d 51/70
U.S. Cl. 260—268 TR 6 Claims

Cis and trans-1-(nitrogen-heterocyclylmethyl)cyclopropa[a]naphthalenes and 1-(nitrogen-heterocyclylmethyl)cycloprop[a]indenes useful as anti-inflammatory agents are disclosed. The trans isomers are prepared by reacting 1,1a,6,6a-tetrahydro-1H-cycloprop[a]indenecarbonyl chloride and 1a,2,3,7b-tetrahydro-1H-cycloprop[a]naphthalenecarbonyl chloride with a nitrogen-containing heterocyclic compound and reducing the amide with lithium aluminum hydride to give the reduced compounds. The cis isomers are prepared by reacting equimolar amounts of cis-1,1a,6,6a-tetrahydro-1H-cycloprop[a]indenecarboxylic acid and cis-1a,2,3,7b-tetrahydro-1H-cycloprop[a]naphthalenecarboxylic acid, a nitrogen-heterocyclic compound and dicyclohexylcarbodiimide and reducing the amides obtained thereby.

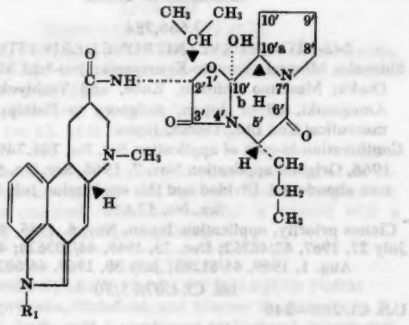
3,666,762

2′β-ISOPROPYL-5′α-N-PROPYL-9,10-DIHYDRO-ERGOPEPTINES

Stephan Guttmann, 18 Hegenheimermattweg 4123, Allschwil, and Rene Huguenin, 25 Mattstuckweg, 4153, Reinach, Basel-land, both of Switzerland

Continuation-in-part of application Ser. No. 836,153, June 24, 1969, now abandoned. This application Nov. 3, 1969, Ser. No. 873,645
Claims priority, application Switzerland, June 25, 1968, 9515/68
Int. Cl. C07d 43/20
U.S. Cl. 260—268 PE 3 Claims

The invention concerns novel compounds of the formula:



wherein R_1 is hydrogen or methyl, and acid addition salts thereof.

Processes and an intermediate employed for the production of the above compounds are also described.

The above compounds are useful in the treatment of circulartory illnesses, and the 1-methyl compound is also useful in stimulating prolactin secretion.

3,666,763

4-PHENYL ISOQUINOLINES AND PROCESS FOR PREPARING SAME

Guenter Grethe, 3 Andover Drive, North Caldwell, N.J., and Milan Radoje Uskokovic, 7 Windermere Road, Upper Montclair, N.J., assignors to Hoffman-LaRoche Inc., Nutley, N.J.

Continuation-in-part of application Ser. No. 830,125, June 3, 1969, now abandoned. This application Jan. 6, 1970, Ser. No. 1,062

Int. Cl. C07d *35/10*

U.S. Cl. 260—289 R 10 Claims

Substituted 4-phenylisoquinolines prepared from the correspondingly substituted 4-phenyl-4-isoquinolinols are described. The end products are useful as antidepressants and hypotensive agents.

3,666,764

SPIROINDENYLPIPERIDINES

Kenneth N. Campbell, Evansville, Ind., and Donald E. Rivard, Medford Lakes, N.J., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Aug. 26, 1970, Ser. No. 67,228

Int. Cl. C07d *29/12*

U.S. Cl. 260—293.62 7 Claims

A class of compounds comprised of 3-phenylspiroindenylpiperidines having substituents on the piperidine nitrogen selected from the group consisting of hydrogen, lower alkyl, benzyl, and phenethyl have been discovered. These compounds are useful as local anesthetic agents. One method of preparation is by heating 1,1-bis(2-dialkylaminoethyl)-3-phenylindenes to eliminate trialkylamines. Subsequent dealkylation provides 3-phenylspiro [indene-1,4′-piperidine] which is reacted with an ester having the formula RX wherein X is a reactive leaving group and R is the desired piperidine substituent. Illustrative of the embodiments are 3-phenylspiro[indene-1,4′-piperidine] and 1′-methyl-3-phenylspiro[indene-1,4′-piperidine].

3,666,765

SYNTHESIS OF 2-PYRIDONES AND DERIVATIVES THEREOF

Antoon M. Berlijckere, Uccle, and Fernand G. F. Eloy, Genese, both of Belgium, assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,862

Int. Cl. C07d *43/06*

U.S. Cl. 260—290 HL 17 Claims

2-Pyridones are conveniently synthesized from 2,4-pentadienoic acids by formation of the acid azide, decomposition of the azide into an isocyanate and the simultaneous cyclization of the isocyanate into the pyridone. The pyridones are readily converted into known pyridines.

3,666,766

SELECTIVE HYDROLYSIS AND CYCLIZATION OF UNSATURATED NITRILES

Joel B. Pedigo, Wheaton, Ill.; Julian Feldman, Cincinnati, and Imre A. Kereszies, Reading, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 27, 1967, Ser. No. 693,735

Int. Cl. C07d *29/32*

U.S. Cl. 260—293.89 13 Claims

A process for selective catalytic hydrolysis and cyclization of unsaturated nitriles to the corresponding lactams, particularly conversion of 2-methylene glutaronitrile to 5-cyano-2-piperidone, the latter compound being claimed as a new composition of matter. 5-cyano-2-piperidone is especially useful for the preparation of polymers and resins such as carboxylated nylons, may be utilized to form polyamides and can be hydrolyized to an amino diacid which can form a linear polyamide useful, after hydrolysis, to adhere nylons and suitably grafted polyethylenes to hydroxyl-containing materials.

3,666,767

2-AMINO-1-(2-IMIDAZOLIN-2-YL)-2-IMIDAZOLINES

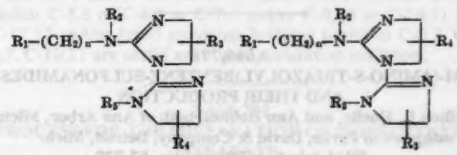
Raymond R. Wittekind, Morristown, and John Shavel, Jr., Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 28, 1970, Ser. No. 6,639

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 R 3 Claims

The present invention relates to 2-amino-1-(2-imidazolin-2-yl)-2-imidazolines, the free base of which has the following structural formulas:



wherein

R_1 is hydrogen, lower alkyl, cycloalkyl, aryl, substituted aryl, heterocyclic, substituted heterocyclic or aryloxy;

R_2 is hydrogen, lower alkyl, aryl and substituted aryl;

or R_1 and R_2 taken together with the nitrogen atom to which they are attached from a heterocyclic ring;

R_3 and R_4 are hydrogen, lower alkyl, aryl, or substituted aryl;

R_5 is hydrogen, lower alkyl, aryl or substituted aryl;

n is an integer from 0 to 10.

The compounds of this invention are useful as antiarrhythmic agents as well as antibacterial agents.

3,666,768

PHOSPHARYLATED 1,2,5-THIADIAZOLES

Michael D. Barker, Maidstone, Kent, England, and Peter Kirby, Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Apr. 12, 1968, Ser. No. 721,088

Claims priority, application Great Britain, Apr. 14, 1967, 17,199/67

Int. Cl. C07d *91/68*

U.S. Cl. 260—302 E 9 Claims

This invention relates to novel dialkyl 3-(1,2,5-thiadiazolyl) phosphates and thionophosphates.

3,666,769

THERMALLY STABLE 2-PERFLUORO-SUBSTITUTED BENZOTHIAZOLES

Frank N. Jones, Wilmington, and Ronld D. Richardson, Claymont, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 9, 1969, Ser. No. 865,204

Int. Cl. C07d *91/44*

U.S. Cl. 260—304 6 Claims

Certain substituted benzothiazoles having in their 2-position a perfluoroalkyl, perfluoroaryl, perfluoro(alkoxyalkyl) perfluoro(aryloxyalkyl) or a polyoxyperfluoroalkylene substituent free of either olefinic or acetylenic unsaturation are very stable to high temperatures and are useful as turbine fluids, hydraulic fluids, lubricants, solvents and heat-transfer fluids. These new compounds can be made by a reaction of o-aminothiophenols or with a perfluoroacid fluoride, followed by cyclization.

3,666,770

PROCESS FOR PREPARING D-5,5-DIMETHYL-Δ^2-THIAZOLINE-4-CARBOXYLIC DERIVATIVES

Malcolm R. Bell, East Greenbush; John A. Carlson, Bethlehem, and Rudolf Oesterlin, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jan. 27, 1970, Ser. No. 6,281
Int. Cl. C07d 91/24
U.S. Cl. 260—306.7 4 Claims

Optically active penicillin and its derivatives are cleaved with an acid catalyst, e.g. trifluoroacetic acid, to form D-5,5-dimethyl-Δ^2-thizaoline-4-carboxylic acid derivatives useful as intermediates for the preparation of synthetic penicillin derivatives having the proper stereochemical requirements at the 2-position thereof.

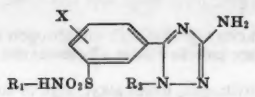
3,666,771

M-(AMINO-S-TRIAZOLYL)BENZENE-SULFONAMIDES AND THEIR PRODUCTION

Milton L. Hoefle, and Ann Holmes, both of Ann Arbor, Mich., assignors to Parke, David & Company, Detroit, Mich.

Filed July 6, 1970, Ser. No. 52,720
Int. Cl. C07d 55/06
U.S. Cl. 260—308 R 10 Claims

Amino-s-triazolybenzenesulfonamides having the formula



where each of R_1 and R_2 is hydrogen or methyl, and X is hydrogen, methyl, methoxy, or halogen, and salts thereof are produced by cyclizing a sulfamoylbenzoic acid 2-amidinohydrazide. The compounds of the invention are useful as pharmacological agents having antiviral activity.

3,666,772

PREPARATION OF PYRAZOLINES BY CYCLIZATION OF AN AZINE

Christian H. Stapfer, Newtown, and Richard W. D'Andrea, New Hope, both of Pa., assignors to Carlisle Chemical Works, Inc., Reading, Ohio

Filed Feb. 26, 1970, Ser. No. 14,628
Int. Cl. C07d 49/10
U.S. Cl. 260—310 D 5 Claims

Alkyl substituted pyrroles and pyrazolines are prepared by treating a ketazine or aldazine with a metal halide of the formula MX_2 where M is cobalt or nickel and X is a halogen at a temperature of 10° to 300° C.

3,666,773

2,2,3,4,5,5-HEXACHLORO-2,5-DIHYDROTHIOPHENE 1,1 DIOXIDE AND ITS USE

Don Robert Baker, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,320
Int. Cl. A61k 27/00; C07d 63/08
U.S. Cl. 260—332.1 1 Claim

The compound 2,2,3,4,5,5-hexachloro-2,5-dihydrothiophene-1,1 dioxide and its use to control bacteria and fungi.

3,666,774

CERTAIN THIENYL ALIPHATIC HYDROCARBON AMIDES

Yoshio Suzuki, Amagasaki-shi; Shunji Aono, Toyonaka-shi, and Hideaki Fukushima, Nishinomiya-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan

Filed Aug. 29, 1969, Ser. No. 854,308
Claims priority, application Japan, Sept. 7, 1968, 43/64394
Int. Cl. C07d 63/10
U.S. Cl. 260—332.2 A 8 Claims

A novel fatty acid amide useful as an anti-arteriosclerotic agent which is represented by the formula,

wherein R represents a saturated or unsaturated straight or branched aliphatic hydrocarbon group having 15 to 25 carbon atoms which may bear a hydroxyl group, A represents a lower alkyl group, aryl group or aralkyl group and B represents a hetero-cyclic radical containing a nitrogen, oxygen or sulfur atom, such as, for example, α-(thienyl or pyridyl)-ethyl or benzyl amide of linoleic acid, isostearic acid, linolenic acid, oleic acid or safflower oil. These compounds are prepared by reacting the appropriate fatty acid or reactive derivative with an amine of the formula,

These compounds may be incorporated in foodstuffs or ingested with a suitable carrier.

3,666,775

PREPARATION OF DESA-9-EN-5-ONE STEROIDS

Milan Radoje Uskokovic, Upper Montclair, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.Y.

Original application Oct. 20, 1965, Ser. No. 499,094, now Patent No. 3,574,761, which is a continuation-in-part of application Ser. No. 400,206, Sept. 29, 1964, now Patent No. 3,412,107. Divided and this application June 17, 1968, Ser. No. 737,362
Int. Cl. C07d 11/00
U.S. Cl. 260—338 23 Claims

This invention is directed to processes for the preparation of desA-androst-9-en-5-ones and desA-pregn-9-en-5-ones which comprises subjecting the corresponding androst-4-en-one or pregn-4-en-3-one respectively to the sequential steps of ozonolysis pyrolyzation, halogenation and dehydrohalogenation. The intermediate products produced in accordance with the processes of this invention can be converted into steroid end products of the 9β, 10α-series which are pharmacologically useful as anabolic and progestational agents.

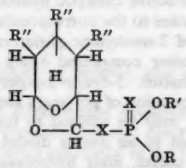
3,666,776

DIOXABICYCLO OCTANE COMPOUNDS

Norman W. Dachs, Buffalo, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Feb. 20, 1970, Ser. No. 13,235
Int. Cl. C07d 21/00
U.S. Cl. 260—340.9 9 Claims

Compounds of the formula



are described wherein R, R' and R'' are independently selected from the group consisting of hydrogen and lower alkyl of one to six carbon atoms ans X is oxygen or sulfur.

The compounds are preferably prepared by reacting acrolein dimer with a phosphorus compound of the formula HXP(X) (OR')(OR).

The compounds are pesticidal, insectidal and acaricidal.

3,666,777

EPOXIDATION OF PROPYLENE UTILIZING MOLYBDENUM-CONTAINING CATALYST SOLUTIONS

Harold A. Sorgenti, Olympia Fields, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Original application Apr. 2, 1969, Ser. No. 812,845, now Patent No. 3,573,226, which is a continuation-in-part of application Ser. No. 647,941, June 22, 1967, now abandoned. Divided and this application Aug. 31, 1970, Ser. No. 68,595

Int. Cl. C07d *1/12, 1/08*

U.S. Cl. 260—348.5 L **2 Claims**

A process for the epoxidation of propylene utilizing as the catalyst a molybdenum-containing epoxidation catalyst solution prepared by heating molybdenum powder with a stream containing unreacted tertiary butyl hydroperoxide used in the epoxidation process as the oxidizing agent and polyhydric compounds of from 200 to 300 molecular weight and having from four to six hydroxyl groups per molecule, the polyhydric compound being formed as a by-product in the epoxidation process.

3,666,778

ANTHRAQUINONE DYESTUFFS

Walter Hohmann, Leverkusen, and Hans-Samuel Bien, Burscheid, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

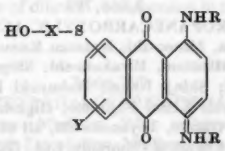
Filed June 20, 1969, Ser. No. 835,222

Claims priority, application Germany, June 29, 1968, P 17 68 789.7 P 17 68 788.6

Int. Cl. C09b *11/56*

U.S. Cl. 260—376 **3 Claims**

Dyestuffs of the formula



in which X is an optionally substituted alkylene radical;

R is an optionally substituted phenyl radical; and Y is H, Cl, Br or —S—X—OH have been prepared.

3,666,779

SULFONAMIDO CARBOXYLIC ACIDS

Helmut Diery; Siegbert Rittner, both of Kelkheim, Taunus, and Horst Lorke, Frankfurt am Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

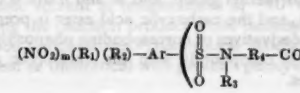
Filed July 11, 1968, Ser. No. 743,926

Claims priority, application Germany, July 15, 1967, P 16 44 893.4

Int. Cl. C07c *143/80*

U.S. Cl. 260—397.7 **2 Claims**

Agents in aqueous metal-working liquids having corrosion inhibiting action and having the general formula



3,666,780

ALKYLIDENE AND HYDROXY OR ACETOXY SUBSTITUTED ALIPHATIC CARBOXYLIC ACIDS AND ESTERS USEFUL IN INSECT CONTROL

Jean Pierre Calame, Fallanden, Switzerland, and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of application Ser. No. 666,484, Sept. 8, 1967, now abandoned. This application Jan. 27, 1970, Ser. No. 6,292

Int. Cl. C07c *59/18, 69/66;* **A01n** *9/24*

U.S. Cl. 260—405 **25 Claims**

Hydrocarbon carboxylic acids, esters, alcohols and ethers containing from 12 to 17 carbon atoms in the hydrocarbon backbone chain and alkyl or alkylidene substituents at the C-7 and C-11 and/or double bond unsaturation between C-2,3 and/or C-5,6 or C-6,7 or C-7,8 and/or C-9,10 or C-10,11 or C-12,13 and/or fused groupings bridging positions C-2,3, C-6,7, C-10,11 are useful arthropod maturation inhibitors.

3,666,781

PROCESS FOR THE PREPARATION OF ISOPROPENYL STEARATE

Samuel Serota, and Edward S. Rothman, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of Agriculture

Filed May 7, 1969, Ser. No. 822,693

Int. Cl. C07c *67/04*

U.S. Cl. 260—410.9 N **3 Claims**

Stearic acid undergoes direct addition of propyne at 160° C. in the presence of zinc stearate catalyst in an inert atmosphere at a pressure of 500 pounds per square inch to form isopropenyl stearate.

3,666,782

PROCESS FOR PRODUCING VINYLCHLOROSILANES

Jeffrey Y. P. Mui, Ossining, N.Y., and Everett W. Bennett, Longmeadow, Mass., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 30, 1970, Ser. No. 76,986

Int. Cl. C07f *7/14*

U.S. Cl. 260—448.2 E **4 Claims**

There is described herein a process for making vinylchlorosilanes by a vapor phase reaction between vinyl chloride and chlorosilicon hydrides. The advantage of this process is that it achieves such reaction at relatively low reaction temperature such as below about 500° C so that reaction can be practiced in reactors made of metals without deleterious attack by by-product hydrogen chloride. Numerous other advantages are cited for the process.

3,666,783

PROCESS FOR THE PREPARATION OF UNSATURATED ORGANOSILICON COMPOUNDS

Marcel Lefort, Caluire, France, assignor to Rhone-Poulenc S.A., Paris, France

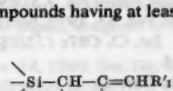
Filed Sept. 9, 1970, Ser. No. 70,910

Claims priority, application France, Sept. 10, 1969, 6930795

Int. Cl. C07f *7/08*

U.S. Cl. 260—448.2 E **10 Claims**

Organosilicon compounds having at least one



where R_1 is H or alkyl and R_2 and R'_1 are H or alkyl or together with the carbon atoms to which they are bonded form an aliphatic or aromatic ring of five or six ring carbon atoms are prepared by reacting

with zinc and a compound containing at least one Si-Cl bond in the presence of a hexa-alkylphosphotriamide or an N-alkylpyrrolidone.

3,666,784

PROCESS FOR PREPARING α,α-FLUORINATED ALKYL ISOCYANATES

Alan F. Clifford; Thomas C. Rhyne, and James W. Thompson, all of Blacksburg, Va., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 27, 1969, Ser. No. 853,541
Int. Cl. C01b *17/45*; C07c *119/04*
U.S. Cl. 260—453 P **2 Claims**

This invention relates to a method for synthesizing an organic isocyanate which is doubly fluorinated at the carbon position adjacent to the isocyanate group which comprises reacting at a temperature of from room temperature up to 80° C. carbonyl fluoride with an organic nitrile, RCN, in anhydrous liquid hydrogen fluoride or an inert hydrocarbon containing catalytic quantities of fluoride to produce a compound having the formula RCF_2NCO where R is selected from alkyl, cycloalkyl, aryl, alkaryl, alkenyl, or cycloalkenyl.

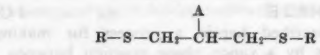
3,666,785

1,3-BIS(ALKOXY-THIO-CARBONYLTHIO)-2-TERTIARY AMINOPROPANE COMPOUNDS

Michihiko Sakai, Kyoto, Japan; Masayuki Kato, Osaka, Japan; Hikoichi Hagiwara, deceased, late of Osaka (by Reiko Hagiwara, executor), and Kazuo Konishi, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Original application Sept. 22, 1966, Ser. No. 612,059, now Patent No. 3,501,502, Original application June 25, 1962, Ser. No. 205,088, now Patent No. 3,318,936. Divided and this application Feb. 13, 1970, Ser. No. 11,345
Claims priority, application Japan, June 27, 1961, 36/23009
Int. Cl. C07c *154/00*
U.S. Cl. 260—455 B **3 Claims**

Compounds of the formula



wherein R represents a lower alkoxy-thiocarbonyl group and A represents a tertiary amino group are useful as pesticides.

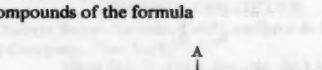
3,666,786

1,3-BIS(N,N-DILOWERALKYL-THIOCARBAMOYLTHIC(2-TERTIARY AMINOPROPANE) COMPOUNDS)

Michihiko Sakai, Kyoto; Masayuki Kato, Osaka, both of Japan; Hikoichi Higiwara, deceased, late of Osaka, Japan (by Reiko Hagiwara, executor), and Kazuo Konishi, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Original application Sept. 22, 1966, Ser. No. 612,059, now Patent No. 3,501,502, Original application June 25, 1962, Ser. No. 205,088, now Patent No. 3,318,936. Divided and this application Feb. 13, 1970, Ser. No. 11,346
Int. Cl. C07c *155/08*
U.S. Cl. 260—455 A **2 Claims**

Compounds of the formula



wherein A represents a tertiary amino group and R represents a N,N-diloweralkylthiocarbamoyl group are useful as pesticides.

3,666,787

PREPARATION OF DIIMINOSUCCINONITRILE FROM HYDROGEN CYANIDE, CHLORINE AND TRIMETHYLAMINE

Owen Wright Webster, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 707,459, Feb. 23, 1968, now Patent No. 3,564,039, and a continuation-in-part of 670,763, Sept. 26, 1967, now abandoned. This application Mar. 18, 1970, Ser. No. 20,820
Int. Cl. C07c *121/20*
U.S. Cl. 260—465.5 **13 Claims**

The process of synthesizing diiminosuccinonitrile by the liquid-phase reaction of hydrogen cyanide with (a) chlorine or cyanogen chloride and (b) a tertiary amine or a soluble cyanide salt.

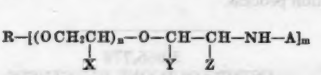
3,666,788

CYANOALKYLATED POLYOXYALKYLENE POLYAMINES

Richard Lee Rowton, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Aug. 22, 1969, Ser. No. 852,487
Int. Cl. C07c *121/42*
U.S. Cl. 260—465.5 R **9 Claims**

Cyanoalkylated polyoxyalkylene polyamines of the formula



wherein A is a cyano-lower-alkyl radical or hydrogen provided at least one A is a cyano-lower-alkyl radical are useful as coupling agents for polymer formation and as curing agents in sprayed polyurea coatings.

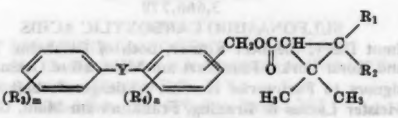
3,666,789

CYCLOPROPANECARBOXYLIC ACID ESTERS

Nobushige Itaya, Minoo-shi; Katsuzo Kamoshita, Toyonaka-shi; Toshio Mizutani, Hirakata-shi; Shigeyoshi Kitamura, Toyonaka-shi; Shinji Nakai; Nobuyuki Kameda, both of Takarazuka-shi; Keimi Fujimoto, Higashiyama-ku, Tyoto, and Yositosi Okuno, Toyonaka-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed May 21, 1969, Ser. No. 827,490
Int. Cl. C07c *69/00*
U.S. Cl. 260—468 **9 Claims**

Novel cyclopropanecarboxylic acid esters having an excellent insecticidal activity and harmless property to mammals and cattles, of the formula



wherein Y is oxygen or sulfur atom, R_1 is hydrogen atom or methyl group, R_2 is methyl, 2-methyl-1-propenyl, 2-methoxycarbonyl-1-propenyl, phenyl or 3,4-methylenedioxyphenyl group when R_1 is hydrogen atom, or methyl group when R_1 is methyl group, R_3 and R_4 are same or different and are a halogen atom or methyl group, and *m* and *n* are 0 or an integer of 1 to 3, and the carboxylic acid ester is prepared by esterifying the derivatives of corresponding phenoxybenzyl or phenylthiobenzyl compounds with the carboxylic acids or their derivatives.

3,666,790

SPIRO[3,3]HEPTANE AMINO ACIDS

Larry J. Loeffler, Bethesda, Md., assignor to Merck & Co., Rahway, N.J.

Filed Apr. 1, 1970, Ser. No. 24,885
Int. Cl. C07c *125/06, 103/09*
U.S. Cl. 260—468 R 3 Claims

Novel spiro[3,3]heptane amino acids and their derivatives are disclosed and their method of preparation is described.

3,666,791

PROCESS FOR THE PURIFICATION OF CRUDE BIS-(β-HYDROXYETHYL) TEREPHTHALATE

Yataro Chikawa; Michiyuki Tokashiki, and Nobuo Suzuki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of application Ser. No. 780,619, Dec. 3, 1968. This application Feb. 24, 1970, Ser. No. 13,462. The portion of the term of the patent subsequent to Jan. 4, 1989, has been disclaimed

Int. Cl. C07c *69/82*
U.S. Cl. 260—475 PR 7 Claims

A process is provided for the purification of crude bis-(β-hydroxyethyl) terephthalate by crystallization. The crude bis-(β-hydroxyethyl) terephthalate is homogeneously dissolved in a solvent at a temperature higher than the apparent melting point of the crude material in the solvent and at a concentration higher than the saturation solubility of the crude material in the solvent at such apparent melting point so as to prepare the heated solution, the heated solution being rapidly cooled from its heated temperature to an optional temperature lower than the apparent melting point so as to precipitate bis-(β-hydroxyethyl) terephthalate from the heated solution as solids in other than a granular or lumpy state. The process is further characterized in that the crude bis-(β-hydroxyethyl) terephthalate or crystallized bis-(β-hydroxyethyl) terephthalate is contacted with hydrogen in the presence of a hydrogenation catalyst before, after, or both before and after the precipitation step in a state wherein the bis-(β-hydroxyethyl) terephthalate is either in a molten form or in a state of dilution or dispersion in the solvent.

3,666,792

POLYMERIC TETRAHALOTEREPHTHALATE ESTERS

Stanley H. Langer, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 13, 1969, Ser. No. 865,797
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 P 3 Claims

Dimers, trimers, other oligomers, and polymers of tetrahaloterephthalate esters and gas-liquid chromatographic separations using same as the stationary liquid phase.

3,666,793

PROCESS FOR THE PRODUCTION OF γ-CHLOROACETOACETIC ACID ESTERS

August Stocker, and Karl-Josef Boosen, both of Visp, Switzerland, assignors to Lonza Ltd., Basel, Switzerland

Filed Apr. 22, 1969, Ser. No. 818,439
Claims priority, application Switzerland, Apr. 24, 1968, 6106/68
Int. Cl. C07c *67/00*
U.S. Cl. 260—479 S 13 Claims

Esters of γ-chloroacetoacetic acid may be prepared by reacting diketene and chlorine in the presence of a low boiling organic solvent at temperatures of −10° to −30° C. and esterifying the reaction product while maintaining the aforementioned temperatures. This process produces yields up to 87 percent of theoretical with product purity of 97 to 98 percent.

3,666,794

STABILIZATION OF ACRYLIC ACID OR ESTERS THEREOF

Susumu Otsuki, and Isao Miyanohara, both of Tsuno-gun, Yamaguchi-ken, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamagushi-ken, Japan

Filed May 8, 1969, Ser. No. 823,181
Claims priority, application Japan, Jan. 22, 1969, 44/4645
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 4 Claims

A process for inhibiting polymerization of acrylic acid or esters thereof and a process for stabilizing a distillation operation of acrylic acid or esters thereof through the joint use of multiple polymerization inhibitors, i.e., hydroquinone, phenol and air (or oxygen) in specified amounts.

3,666,795

METAL PETROLEUM SULFONATE RECOVERY

Harold C. Walters, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 9, 1967, Ser. No. 681,889
Int. Cl. C07c *13/00*
U.S. Cl. 260—504 A 7 Claims

Metal petroleum sulfonates are recovered from commercial oil-containing concentrates by diluting the concentrate with a volatilizable hydrocarbon diluent, and extracting the mixture with a lower alcohol such as methanol or ethanol. The metal petroleum sulfonate, which is useful as a detergent additive for lubricating oils, is recovered from the alcohol phase as a substantially dry powder.

3,666,796

2,2'-DISULFONATED DIALKYL SULFOXIDES AND SULFONES

Jacobus Roelof Nooi, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of application Ser. No. 824,386, May 8, 1967, now abandoned, Continuation of application Ser. No. 456,825, May 18, 1965, now abandoned. This application Nov. 7, 1969, Ser. No. 874,983
Int. Cl. C07c *143/20*
U.S. Cl. 260—513 R 11 Claims

Detergent compounds which are 2,2'-disulfonated dialkyl sulfoxides and sulfones and which can be prepared by reacting an alpha olefin with a sulfur chloride to form a dichlorinated dialkyl thioether and then subjecting the thioether, in either order, to oxidation to oxidize the sulfur atom to a sulfoxide, sulfone and a mixture thereof and to sulfonation to effect replacement of the chlorine atoms by sulfonate groups.

3,666,797

METHOD OF PREPARING LIGHT-COLORED PARAFFIN SULFONIC ACID

Masuzo Nagayama, Tokyo, and Terunosuke Kawana, Funabashi-shi, both of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1969, Ser. No. 877,013
Claims priority, application Japan, Nov. 20, 1968, 43/84770
Int. Cl. C07c *143/02*
U.S. Cl. 260—513 R 7 Claims

A method of preparing a light-colored paraffin sulfonic acid comprising the steps of separating a heavy layer containing paraffin sulfonic acid from an reacted mixture obtained through sulfoxidation reaction of paraffin and concentrating said heavy layer, wherein the concentration of the heavy layer is carried out in the presence of hydrogen peroxide.

3,666,798

PRODUCTION OF OPTICALLY ACTIVE CHRYSANTHEMIC ACID

Masanao Matsui, Tokyo, and Fukashi Horiuchi, Saitama-ken, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan

Filed Aug. 10, 1970, Ser. No. 62,617
Claims priority, application Japan, Sept. 12, 1969, 44/73014
Int. Cl. C07c *61/16*
U.S. Cl. 260—514 P 8 Claims

An optical resolution method for preparation of optically active chrysanthemic acid which comprises reacting (±)-chrysanthemic acid with L-lysine to form (+)-chrysanthemic acid L-lysine salt and decomposing the salt with a dilute acid.

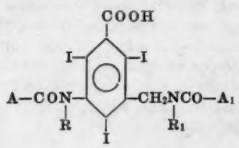
3,666,799

TRIIODATED TOLUIC ACIDS

Jack Bernstein, and Kathryn Alice Losee, both of New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed June 19, 1970, Ser. No. 47,882
Int. Cl. C07c *103/30*
U.S. Cl. 260—518 A 8 Claims

This invention relates to new carbamoyl derivatives of diaminotriiodo-m-toluic acid having the formula



and to salts and lower alkyl esters of these compounds, which are useful as radiopaque agents.

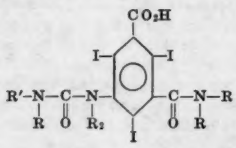
3,666,800

SUBSTITUTED TRIIODOISOPHTHALAMIC ACIDS

Jack Bernstein, and Kathryn Alice Losee, both of New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed June 19, 1970, Ser. No. 47,886
Int. Cl. C07c *103/30*
U.S. Cl. 260—518 A 5 Claims

Compounds having the formula



wherein R and R_2 are hydrogen or alkyl and R′ is alkyl, as well as salts and lower alkyl esters of these compounds are useful as radiopaque agents.

3,666,801

4-TERT-BUTYLPHENYLHYDRAZONES OF PYRUVIC ACIDS

Richard A. Robinson, Evanston, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 8, 1969, Ser. No. 848,704
Int. Cl. C07c *109/12*
U.S. Cl. 260—518 R 4 Claims

Hydrazones of pyruvic acid and substituted pyruvic acids with 4-tert-butylphenylhydrazine are described herein. They are anti-inflammatory agents. Hydrolysis of the appropriate ester gives the present acids and the esters are prepared by the reaction of the appropriate pyruvate with 4-tert-butylphenylhydrazine or by reaction of the appropriate substituted acetoacetic ester with 4-tert-butylbenzenediazonium chloride.

3,666,802

RECOVERY OF 3-(3,4-DIHYDROXYPHENYL)-L-ALANINE FROM BEANS WITH WATER

Zenon Jacura, North Plainfield; Phillip Adams, Murray Hill, and Benedict R. Juliano, Mountainside, all of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Filed May 4, 1970, Ser. No. 34,573
Int. Cl. C07c *101/72*
U.S. Cl. 260—519 3 Claims

L-DOPA is recovered from, preferably comminuted, beans containing it by contacting the beans with a reagent consisting essentially of liquid water. Efficacious novel products comprising L-DOPA are produced.

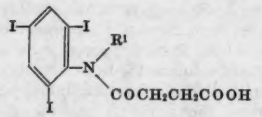
3,666,803

N-HYDROXYALKYL-2,4,6-TRIIODOSUCCINANILIC ACIDS

Hugo Holtermann, Baerum, Norway, assignor to Nyegaard & Co. A/S, Oslo, Norway

Filed June 6, 1969, Ser. No. 831,207
Claims priority, application Great Britain, June 11, 1968, 27,698/68
Int. Cl. C07c *103/32*
U.S. Cl. 260—519 4 Claims

Compounds of the formula



wherein R^1 is an alkyl group carrying at least one hydroxyl group and salts thereof with bases. The compounds are prepared by reacting 2,4,6-triiodosuccinanilic acid with a hydroxyalkylating agent. The compounds are useful as cholecystographic agents.

3,666,804

OXIDATION PROCESS

R. Parthasarathy, Takoma Park, and Frank G. Ciapetta, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 26, 1966, Ser. No. 589,510
Int. Cl. C07c *51/26*, *53/08*
U.S. Cl. 260—530 N 10 Claims

Methods of oxidizing alpha unsaturated aldehydes to the corresponding alpha unsaturated monocarboxylic acids are disclosed. The methods are characterized in one aspect by the use of a molybdenum phosphate catalyst. Methods of producing the alpha unsaturated aldehydes starting material from the corresponding unsaturated olefins are also disclosed.

3,666,805

PREPARATION OF METHACRYLIC ACID

Theodor Volker, and Erika Pichler, both of Freiburg, Switzerland, assignors to Lonza Ltd., Gampel (Canton of Valais), Basel, Switzerland

Filed Mar. 11, 1966, Ser. No. 533,441
Claims priority, application Switzerland, Mar. 12, 1965, 3495/65
Int. Cl. C07c *57/04*
U.S. Cl. 260—531 R 8 Claims

Methacrylic acid can be prepared by a novel process comprising heating α-hydroxyisobutyric acid in the presence of a compound of basic reaction at a temperature of about 160° to 340° C. in a reaction medium comprising an inert polar liquid having a boiling point above 200° C.

3,666,806

HALOADAMANTANES

Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Dec. 17, 1968, Ser. No. 784,486
Int. Cl. C07c 29/00
U.S. Cl. 260—617 F 11 Claims

Halogenated derivatives containing the adamantane nucleus are produced by admixing, in the presence of strong sulfuric acid, adamantane or alkyl-substituted adamantane with a selected halo-yielding salt of an alkali or alkaline earth metal, or a corresponding hydrogen halide.

3,666,807

PROCESS FOR PRODUCING UREA

Akio Yamagishi, and Genya Matumoto, both of Nihama-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan

Filed Feb. 7, 1969, Ser. No. 797,623
Claims priority, application Japan, Feb. 12, 1968, 43/9017
Int. Cl. C07c 127/00
U.S. Cl. 260—555 A 2 Claims

The present invention discloses a process for the synthesis of urea wherein, in a process for the synthesis of urea in combination with a process for the synthesis of ammonia, the necessity of cooling the circulating gas of the process for the synthesis of ammonia for separating ammonia for use in the synthesis of urea is eliminated, thereby not only avoiding the heat loss due to the cooling but also rendering unnecessary the facilities for the cooling. Thus, the process is made simple and economical.

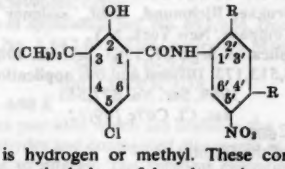
3,666,808

SUBSTITUTED NITROSALICYLANILIDES

William H. Meek, Northfield, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Feb. 9, 1970, Ser. No. 9,981
Int. Cl. C07c 103/26
U.S. Cl. 260—559 S 5 Claims

The compounds disclosed herein are defined by the formula



wherein R is hydrogen or methyl. These compounds are found to be particularly useful as bacteriostats, as lamprecides and as differential fish toxicants. The compounds are found to be particularly effective for such purposes because of the nitro group in the 5′ position and because of the tertiary-butyl group in the 3 position.

3,666,809

METHOD FOR THE PRODUCTION OF ACRYLAMIDE CRYSTALS

Kenzo Okuno, Tokyo; Takaharu Itagaki, Kitakyushu; Yoshimasa Isogai, Tokyo; Kazuo Yoshida, Kitakyushu; Konosuke Fujiki, Kitakyushu, and Katumi Odagawa, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Sept. 25, 1970, Ser. No. 75,692
Claims priority, application Japan, Oct. 8, 1969, 44/80543; 44/80544; 44/80545
Int. Cl. C07c 103/00
U.S. Cl. 260—561 N 7 Claims

A method for the production of acrylamide crystals, characterized in preparing acrylamide crystals from an aqueous acrylamide solution, which contains at least one kind of surfactant selected from the group consisting of a cellulose glycolic acid salt and polyoxyethylene alkyl amine- and polyoxyethylene alkyl amide-type surfactants. The resulting acrylamide crystals are of higher purity, having less susceptibility to being concreted.

3,666,810

NOVEL N-3-AMINOALKYL AMIDES, POLYMERS THEREOF, AND METHOD FOR THEIR PREPARATION

Donald I. Hoke, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed June 11, 1969, Ser. No. 832,412
Int. Cl. C07c 103/00
U.S. Cl. 260—561 N 15 Claims

N-3-Aminoalkyl propionamides with an ether substituent on the beta carbon atom are prepared by the reaction of analogous N-3-oxohydrocarbon-substituted amides with an amine in the presence of a reducing agent, preferably hydrogen and a hydrogenation catalyst. The resulting compounds can be converted to acrylamides by pyrolysis in the presence of a strong base. The latter compounds may so be prepared by the reaction of an α,β-unsaturated amine with an acrylonitrile in the presence of sulfuric acid. They are useful for improving dyeability of fiber-forming polymers and may be polymerized to form compositions which improve paper strength and (in their quaternized form) are excellent flocculants.

3,666,811

N- 2-(DIPHENYLMETHOXY)ETHYL -N-METHYLCINNAMYLAMINE AND THE SALTS THEREOF

Cornelis van der Stelt, Haarlem, Netherlands, assignor to N. V. Koninklijke Pharmaceutische Fabrieken v/h Brocades-Stheeman & Pharmacia, Amsterdam, Netherlands

Filed July 18, 1969, Ser. No. 843,170
Claims priority, application Great Britain, July 19, 1968, 34,700/68
Int. Cl. C07c 93/08
U.S. Cl. 260—570 R 2 Claims

New diphenylmethoxyethylamino derivatives are provided in which the diphenyl group may contain halogen and lower alkyl substituents and in which the amino group may be a secondary or tertiary amino group having a phenyl-lower alkyl or a phenyl lower alkenyl substituent together with a hydrogen or lower-alkyl substituent. The new compounds have valuable therapeutic properties.

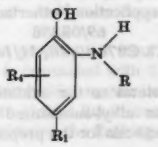
3,666,812

DIAMINO PHENOL HAIR DYEING COMPOUNDS

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne sur Seine, both of France, assignors to Societe Anonyme Dite: L'Oreal, Paris, France

Continuation-in-part of application Ser. No. 574,860, July 11, 1966, now abandoned, which is a division of application Ser. No. 293,282, July 3, 1963, now abandoned. This application June 12, 1967, Ser. No. 645,519
Claims priority, application France, July 11, 1962, 903703; July 3, 1963, 940212
Int. Cl. C07c 91/44
U.S. Cl. 260—574 6 Claims

Compounds suitable for use in one step hair and keratin fiber dyeing compositions which do not require the use of separate dye modifiers and are exceptionally color stable, having the formula



in which R is selected from the group consisting of hydrogen and alkyll R_1 is selected from the group consisting of alkyl, alkoxy, and dialkylamino, R_4 which can be in position 5 or 6 on the ring is selected from the group consisting of hydrogen, halogen, hydroxy, alkyl, alkoxy and NH_2, and at least one of said R_1 and R_4 is said dialkylamino or said NH_2.

3,666,813

PROCESS FOR PREPARING AROMATIC HALOAMINES FROM AROMATIC NITROAMINES

Saul G. Hindin, Mendham; Daniel L. Bair, Roselle Park, and Duane R. Steele, Newark, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.

Filed Aug. 27, 1969, Ser. No. 853,503
Int. Cl. C07c *85/10*
U.S. Cl. 260—580 **6 Claims**

Process for preparing aromatic haloamines comprises hydrogenating the corresponding halogen-substituted nitroaromatic compound in the presence of a platinum group metal catalyst, said catalyst being modified with a metal selected from the group Pb, Bi, or Ag. The catalysts are effective at relatively mild conditions and the hydrogenation is effected with minimum dehalogenation.

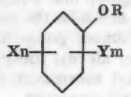
3,666,814

CHLORONITROPHENYL ETHERS AS HERBICIDES

Delta W. Gier, Saint Andrews College, Laurinburg, N.C., and Daniel M. Wasleski, 10009 Mercier, Kansas City, Mo.

Division of Ser. No. 675,331, Oct. 16, 1967
Filed Mar. 3, 1970, Ser. No. 18,805
Int. Cl. C07c *49/80*
U.S. Cl. 260—590 **10 Claims**

Compounds of the formula



where R is alkyl, cycloalkyl, dihalo triazinyl, quinoxalinyl, alkyl quinoxalinyl, acetonyl, arylketoalkyl, epoxyalkyl, aminoarylketoalkyl, haloarylketoalkyl, X is halogen, Y is nitro, *n* is an integer of 1 to 3 and *m* is an integer of 1 to 2 have been found useful as nematocides, herbicides, fungicides and desiccants.

3,666,815

METHOD FOR THE CATALYTIC OXIDATION OF ALKYL AROMATES

Paulus I. T. Scheltus, Noordwijk, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel Er Verkeer, The Hague, Netherlands

Filed May 18, 1970, Ser. No. 38,557
Claims priority, application Netherlands, June 10, 1969, 69/08858
Int. Cl. C07c *49/78, 31/14, 73/08*
U.S. Cl. 260—592 **7 Claims**

This invention relates to the oxidation of alkyl aromatic compounds with an alkyl-substituted phthalocyanine as a catalyst and with methods for the preparation of this catalyst.

3,666,816

METHOD FOR PRODUCTION OF METHYL ISOBUTYL KETONE

Kazumi Takagi; Masahiro Murakami, and Koichi Iketani, all of Niihama-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Oct. 6, 1969, Ser. No. 864,173
Claims priority, application Japan, Oct. 12, 1968, 43/74498; Feb. 3, 1969, 44/8380; Aug. 1, 1969, 44/61162
Int. Cl. C07c *49/04*
U.S. Cl. 260—593 **2 Claims**

A novel method for producing methyl isobutyl ketone from acetone and hydrogen in one stage with improved conversion and selectivity by contacting acetone in liquid phase with hydrogen in the presence of a catalyst of (a) palladium and synthetic zeolite, or (b) palladium and alumina together with or without thorium oxide, zirconium oxide and/or chromium oxide, at a temperature of 100° to 250° C. and under a partial pressure of hydrogen of 0.1 to 10 kg per square centimeter.

3,666,817

TETRAKIS (HYDROXYMETHYL) PHOSPHONIUM CHLORIDE FROM PHOSPHINE AND FORMALDEHYDE

Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed July 13, 1970, Ser. No. 54,574
Int. Cl. C07f *9/02*
U.S. Cl. 260—606.5 F **7 Claims**

A process is described for the preparation of tetrakis(hydroxymethyl) phosphonium chloride (THPC) by a direct two-step process of reacting phosphine and excess formaldehyde under pressure of from about 4 to about 15 atmospheres at a temperature of from 25° to 70° C.,, whereby a tris(hydroxymethyl) phosphine hemiacetal solution is obtained which is then treated with hydrochloric acid to produce the phosphonium chloride.

3,666,818

TRIFLUOROBUTENYL SULFIDES

Mervin E. Brokke, Richmond, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Original application Sept. 27, 1965, Ser. No. 490,664, now Patent No. 3,513,172. Divided and this application Nov. 20, 1969, Ser. No. 877,541
Int. Cl. C07c *149/12*
U.S. Cl. 260—608 **4 Claims**

Compounds of the formula

$$CF_2{=}CFCH_2CH_2S{-}R$$

in which R is a member selected from the group consisting of 3,4,4-trifluoro-3-butenyl, thio-3,4,4-trifluoro-3-butenyl and benzyl. The compounds are useful as nematocides.

3,666,819

PROCESS FOR PREPARING POLYHALO PHENOLS

Edwin B. Michaels, Gregory Court, Norwalk, Conn., and John W. Lee, Glen Avenue, Norwalk, Conn.

Filed July 31, 1968, Ser. No. 748,981
Int. Cl. C07t *39/32*
U.S. Cl. 260—623 R **10 Claims**

A process is provided for the hydrolysis of polyhalobenzenes to polyhalophenols in good yields and purity by initially reacting ethylene glycol with an alkali metal hydroxide to obtain a mixture comprising ethylene glycol alkali metal derivative, alkali metal hydroxide and ethylene glycol, adding to the latter mixture a mono- or di-alkylated benzene, such as toluene or ethylbenzene, then introducing a polyhalobenzene, whereby hydrolysis of the latter occurs and, thereafter, recovering the hydrolyzed benzene.

3,666,820

PROCESS FOR THE PREPARATION OF ALKYL, PERFLUOROALKYL AND ARYL IODIDES

Leonard S. Silbert, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of Agriculture

Original application Feb. 28, 1968, Ser. No. 708,804, now Patent No. 3,531,535. Divided and this application Mar. 23, 1970, Ser. No. 24,924

Int. Cl. C07c *19/08*

U.S. Cl. 260—653 2 Claims

High yields of alkyl, perfluoroalkyl and aryl iodides are prepared directly from their corresponding carboxylic acids by reaction in solution with iodine and aroyl peroxide or t-butylperoxyisopropyl carbonate. The reaction is conducted at a temperature of about 110°–125° C. for about 2 to 3 hours in solvents such as 1,3-dichloropropane, 1,3-dibromopropane and 1,1,2,2-tetrachlorodifluorethane. Solvents such as 1,2-dichloroethane and carbon tetrachloride can be used as solvents but they require longer reaction times.

3,666,821

DEUTERATED METHYLENE CHLORIDE

Joseph G. Atkinson, Montreal, Quebec, and Erskine Simons, Jr., Niagara Falls, Ontario, both of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 29, 1968, Ser. No. 756,298

Int. Cl. C07c *17/00, 19/02*

U.S. Cl. 260—664 12 Claims

A method for the preparation of methylene-d2 chloride which comprises treating methylene chloride with (1) deuterium oxide in the presence of a catalyst and solvent; (2) a deuterated solvent in the presence of a catalyst; or (3) deuterium oxide in the presence of a deuterated catalyst and a deuterated solvent.

3,666,822

URANIUM-MOLYBDENUM OXIDATION CATALYSTS

Robert K. Grasselli, Garfield Heights, and Maria S. Friedrich, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of application Ser. No. 691,934, Dec. 20, 1967, now Patent No. 3,542,842. This application Mar. 5, 1970, Ser. No. 16,923

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E 8 Claims

Catalysts are provided which are useful in the oxidation of olefins to aldehydes and conjugated dienes and in ammoxidation of olefins to nitriles. The catalysts comprise the combined oxides of uranium and molybdenum and the combined oxides of uranium and molybdenum in combination with arsenic, bismuth, tin, vanadium, iron, nickel and cobalt.

3,666,823

URANIUM-ARSENIC OXIDATION CATALYSTS

Robert K. Grasselli, Garfield Heights, and Maria S. Friedrich, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of application Ser. No. 691,992, Dec. 20, 1967, now abandoned. This application Mar. 5, 1970, Ser. No. 16,984

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E 9 Claims

Catalysts are provided which are useful in the oxidation of olefins to aldehydes and conjugated dienes and in ammoxidation of olefins to nitriles. The catalysts comprise the combined oxides of uranium and arsenic on a catalyst support and the combined oxides of uranium and arsenic promoted by molybdenum, boron, vanadium, tin, nickel, bismuth, chromium, iron, manganese, zinc, tungsten, antimony, cerium, cobalt or rhenium.

3,666,824

HYDROEALKYLATION PROCESS AND CATALYST

John W. Jenkins, Seabrook, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed May 20, 1970, Ser. No. 39,873

Int. Cl. C07c *3/58*

U.S. Cl. 260—672 R 6 Claims

Alkylaromatics are hydrodealkylated to aromatics by passage with hydrogen over a supported catalyst of nickel and a Group I*b* or II*b* metal promoter at elevated temperatures.

3,666,825

PROCESS FOR ALKYLATING AROMATIC HYDROCARBONS

Bernard Torck, Chatou, and Lucien Sajus, Croissy, both of France, assignors to Institut Francais Du Petrole, Des Carburants Et Lubrifiants, Rueil-Malmaison, France

Filed Dec. 8, 1970, Ser. No. 96,276

Claims priority, application France, Dec. 11, 1969, 6943079

Int. Cl. C07c *3/56*

U.S. Cl. 260—671 R 10 Claims

Process for alkylating an aromatic hydrocarbon wherein said hydrocarbon is reacted with a member of the group consisting of the olefines and the alkyl halides in the presence of a Lewis acid of the formula R M X_{n-1}, in which R is a monovalent organic radical having one – 20 carbon atoms, selected from the group consisting of the alkyl, cycloalkyl, aryl, aralkyl and alkoxy groups, X is a halogen atom or an electronegative group, M is a metal from groups IIIb, IVb and Vb of the periodic classification of the elements and n is the highest valence of the metal, said process comprising using water in a molar proportion of from 0.01 to 5 times that of the Lewis acid.

3,666,826

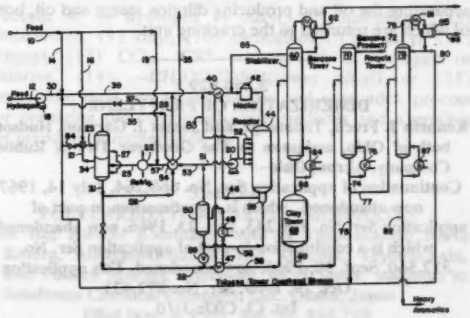
PURIFICATION OF HYDRODEALKYLATION REACTION VENT HYDROGEN

Bernard I. Newberger, Brooklyn; Stanley W. Ehrlich, Far Rockaway, and Manuel N. Vergara, Rego Park, all of N.Y.

Filed Dec. 24, 1970, Ser. No. 101,321

Int. Cl. C07c *3/58*

U.S. Cl. 260—672 R 7 Claims



In a hydrodealkylation process the vent hydrogen stream from the reaction zone is contacted with 5 to 20 mole percent of liquid C_7 to C_9 aromatics in one or two stages. The mixture is then flashed to yield a liquid containing about 95 percent of the benzene entering the flashing zone.

3,666,827

QUATERNARY SUBSTITUTED HYDROCARBONS

Emil H. Carlson, Kirkwood; William C. Hammann, Creve Coeur, and Robert M. Schisla, Kirkwood, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 14, 1969, Ser. No. 877,043
Int. Cl. C07c 9/00
U.S. Cl. 260—676 11 Claims

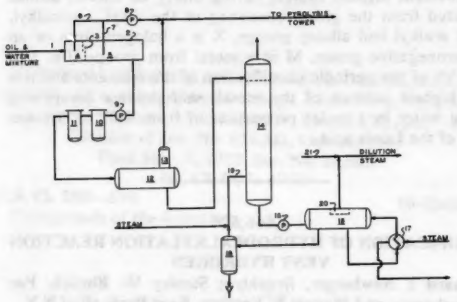
High molecular weight hydrocarbons containing from about 28 to 40 carbon atoms and from two to four gem-dimethyl units interspersed in an aliphatic chain are useful as lubricants and other functional fluids and have a wide liquid range, good thermal stability and resistance to the formation of sludge and other insoluble decomposition products due to oxidation at elevated temperatures.

3,666,828

CONDENSATE PURIFICATION AND RECOVERY FOR USE AS DILUTION STEAM TO PYROLYSIS FURNACE

Carl A. Post, and Eldred J. Cabanaw, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Sept. 14, 1970, Ser. No. 71,786
Int. Cl. C07c 3/30; C10g 9/36, 33/00
U.S. Cl. 260—683 R 9 Claims



A condensate purification and recovery method and apparatus for purifying water from the pyrolysis tower of a naphtha cracking unit which involves settling the water and separating the oil and producing dilution steam and oil, both of which are returned to the cracking unit.

3,666,829

DIMERIZATION OF PROPYLENE

Kenneth J. Frech, Tallmadge, and James J. Garmon, Hudson, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of application Ser. No. 668,264, July 14, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 539,243, Feb. 23, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 312,560, Sept. 30, 1963, now abandoned. This application Oct. 29, 1969, Ser. No. 872,421
Int. Cl. C07c 3/16
U.S. Cl. 260—683.15C 4 Claims

Propylene is polymerized with an acid catalyst in an aqueous reaction mixture. During substantially the entire polymerization period there is present in the reaction mixture a dimer solvent which is sufficiently immiscible with the reaction mixture to form a second layer in the reaction zone to thus remove from the reaction mixture the dimer which is produced and thus prevent its further polymerization.

3,666,830

LEAD COMPOUND CATALYZED SILOXANE RESIN SYSTEM

Alvin J. Alekna, Scotia, N.Y., assignor to General Electric Company

Continuation of application Ser. No. 782,470, Dec. 9, 1968, now abandoned. This application Jan. 21, 1971, Ser. No. 108,652
Int. Cl. C08g 47/04, 47/10, 31/32
U.S. Cl. 260—825 6 Claims

A molding compound contains an uncured siloxane resin, a lead containing catalyst, and a silane or polysiloxane containing an appreciable amount of hydanol or alkoxy groups. The molding compound is relatively stable at flow temperatures but cures rapidly at molding temperatures. The molding compound is used in the transfer molding of transistor housings.

3,666,831

THIOL-TYPE THIAMINE THIONOTHIOLCARBONATES

Akira Takamizawa, Ibaraki-shi, and Kentaro Hirai, Kyoto-shi, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Feb. 17, 1969, Ser. No. 799,899
Claims priority, application Japan, Mar. 5, 1968, 43/14148
Int. Cl. C07d 51/42
U.S. Cl. 260—256.5 B 11 Claims

Thiol-type thiamine thionothiolcarbonates, i.e. O-(lower)-alkoxycarbonyl-S-(substituted or unsubstituted)-phenylthiothiocarbonylthiamines, being prepared from S-alkali salts of O-(lower)-alkoxycarbonylthiamines by an interaction with (substituted or unsubstituted)-phenylthiothiocarbonyl group-introducing agents, or from S-alkali salts of thiamine by an interaction with the (substituted or unsubstituted)-phenylthiothiocarbonyl group-introducing agents followed by alkoxycarbonylation of the O-position, possessing anti-inflammatory activity and also rapid, prolonged and high level vitamin B_1 activity, and being sufficiently stable for various pharmaceutical preparations.

3,666,832

STABLE VINYL CHLORIDE INTERPOLYMER SYSTEMS

Charles K. Bump, Hampden, and Frank J. Hahn, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 714,774, Mar. 21, 1968, now abandoned. This application July 17, 1970, Ser. No. 55,963
Int. Cl. C08q 37/32; C08f 45/56
U.S. Cl. 260—853 9 Claims

Disclosed herein are compositions of etherified aminoplast resins and copolymers of vinyl chloride and hydroxy containing fumarate diesters cured with phosphoric acid compounds. These compositions when coated on substrates, display excellent strength characteristics and light stability.

3,666,833

METHOD FOR MANUFACTURING SURFACE COATINGS AND FILMS AND SURFACE COATINGS AND FILMS FOR CARRYING OUT THIS METHOD

Horst Dalibor, and Themistoklis Katsibas, both of Hamburg, Germany, assignors to Reichhold, Albert, Chemie Aktiengesellschaft, Hamburg, Germany

Filed May 27, 1970, Ser. No. 40,757
Claims priority, application Switzerland, May 27, 1969, 7986/69
Int. Cl. C08g 22/04
U.S. Cl. 260—856 10 Claims

The invention relates to an improved method for providing surface sheetings or coatings and to a stoving enamel for carrying out this method, the enamel being resistant to solvents and alkalis, wherein the improvement comprises that the

stoving enamel, applied to a metal base, hardens after three to four days' exposure to air at about 20° C so that the film does not swell under the action of water and cannot be removed by scratching, and wherein the said film is made by forming under simultaneous removal of the solvent from polyhydroxyl compounds, based on copolymers containing hydroxyl groups, copolymerized aromatic substances and polyisocyanates in solvents, without active hydrogen atoms.

3,666,834

ORIENTED THERMOPLASTIC FILMS COMPRISING POLYPROPYLENE AND POLY(PARA-TERTIARY-BUTYL-STYRENE)

Edward M. Bullard, Rochester, N.Y., assignor to Mobil Oil Corporation

Filed July 29, 1970, Ser. No. 59,331
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 A **2 Claims**

A resinous blend composition, adaptable for fabrication into an oriented film structure having improved physical properties comprising a polyolefin such as polypropylene containing incorporated therein additive amounts, on the order of from about 10 percent to about 40 percent by weight of a tertiary butyl substituted aromatic resin, such as poly(para-tertiary-butyl styrene).

3,666,835

POLYURETHANE SYSTEMS

Hans R. Schloss, Wallington, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Apr. 16, 1970, Ser. No. 29,306
Int. Cl. C08g *41/04, 22/14*
U.S. Cl. 260—858 **9 Claims**

Solvent-free polyurethane systems particularly useful as textile laminating adhesives comprise a hydroxyl-terminated urethane prepolymer and an isocyanate-terminated urethane prepolymer.

3,666,836

BLENDS OF POLYPROPYLENE WITH HYDROGENATED HYDROCARBON RESINS

Andrew John, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sept. 26, 1969, Ser. No. 861,445
Int. Cl. C08f *41/12, 29/12*
U.S. Cl. 260—897 A **3 Claims**

Blends of polypropylene with hydrogenated polymers and copolymers of styrene. The useful polymers have a precisely defined molecular weight distribution and must be hydrogenated to the point where at least 50 percent of the aromatic unsaturation is reduced. The blends are useful in preparation of heat sealable films and capacitor dielectrics.

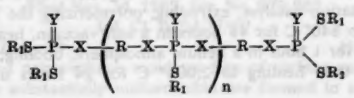
3,666,837

POLYMERCAPTO POLYPHOSPHITES

Kenneth H. Rattenbury, Morgantown, W. Va., assignor to Weston Chemical Corporation, New York, N.Y.

Filed June 24, 1969, Ser. No. 836,150
Int. Cl. C07f *9/16*; B01j *1/16*; C08f *45/58*
U.S. Cl. 260—928 **17 Claims**

Compounds are prepared having the formula



where n is zero or an integer, preferably not over 9, R is a divalent aromatic, aliphatic or cycloaliphatic group, R_1 is alkyl, haloalkyl, aryl, haloaryl, alkenyl, aralkyl, haloalkenyl, cycloalkyl, X is S, Y is nothing or oxygen.

The thiophosphites are useful as antioxidants and as defoliants. The thiophosphates are useful as plasticizers and defoliants.

3,666,838

PROPENYL AND PROPADIENYLPHOSPHONIC ACIDS 2-PROPADIENYL-4-OXO-1,3-DIOXA-2-PHOSPHANAPHTHALENE-2-OXIDE

Janos Kollonitsch, Westfield, and George Gal, Watchung, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed July 14, 1969, Ser. No. 841,547
Int. Cl. C07f *9/08, 9/38, 9/40*
U.S. Cl. 260—937 **1 Claim**

Cis-1-propenyl phosphonic acid and propadienylphosphonic acid are made from propargyl alcohol and 2-halo-4-oxo-1,3-dioxa-2-phosphanaphthalene via reaction of the two, rearrangement of the resulting propargyloxy compound, reduction of the propadienylphosphonate thus formed and/or hydrolysis of the ester function. The intermediates for example, 2-propadienyl-4-oxo-1,3-dioxa-2-phosphanaphthalene-2-oxide, are novel compounds.

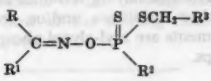
3,666,839

OXIMINOPHOSPHONODITHIOATES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Apr. 6, 1970, Ser. No. 26,148
Int. Cl. C07f *9/06*; A01n *9/36*
U.S. Cl. 260—940 **10 Claims**

Compounds having the formula



in which R is (1) alkyl or (2) lower alkylthiomethyl; R^1 is alkyl; R^2 is alkyl; and R^3 is (1) hydrogen, (2) lower alkylthio, (3) cyano, (4) phenylthio, (5) substituted phenylthio wherein the substituent is halogen,

(6)

wherein R^4 is hydrogen or alkyl, (7) halophenyl, (8) phthalimido, (9) vinyl, (10) carboalkoxy, (11) alkyl, (12) ethynyl, (13) CCl_2 CR^5—wherein R^5 is hydrogen or chlorine, (14) $-CH_2OC(O)NH$(lower alkyl) or (15) benzylthio, their use as insecticides and acaricides, process for preparing the compounds, intermediates and a process for preparing intermediates.

3,666,840

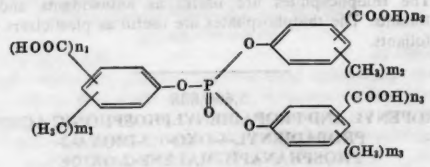
POLYCARBOXY-TRIPHENYL PHOSPHATES

Ken Ito; Hiroshi Kaminaka, both of Toyonaka-shi; Norio Kotera, Amagasaki-shi; Hiroshi Kuruma, Toyonaka-shi, and Yoshiro Murata, Minoo-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Sept. 2, 1969, Ser. No. 854,729
Claims priority, application Japan, Sept. 19, 1968, 43/68097; Feb. 26, 1969, 44/14945
Int. Cl. C07f *9/08, 9/12*
U.S. Cl. 260—942 **9 Claims**

Polycarboxy-triphenyl phosphates are prepared by oxidizing corresponding polymethyltriphenyl phosphates. They are fire resistant and stable, and are useful not only as fire-retarding agents for high polymer materials but also as inter-

mediates for various synthetic products. When these esters and hydrolyzed, corresponding aromatic hydroxycarboxylic acids can be obtained with advantages.



wherein n_1, n_2 and n_3 are individually zero or an integer of up to 2, and $n_1 + n_2 + n_3$ is 2 or more; m_1, m_2 and m_3 are individually zero or an integer of up to 2, and $n_1 + m_1$, $n_2 + m_2$ and $n_3 + m_3$ do individually not exceed 3; and the substituted positions of the carboxyl groups are in the 3-, 4- or 5-positions of the individual phenyl groups.

3,666,841

ARYL-POLYOL PHOSPHITE HAVING TERMINAL HALIDE GROUPS

Walter R. May, St. Louis, Mo.; Dudley Bruce Merrifield, Williamsville, N.Y., and Lewis Bsharah, St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.

Continuation-in-part of application Ser. No. 727,322, May 7, 1968, now abandoned. This application Mar. 10, 1969, Ser. No. 808,035

Int. Cl. C07f 9/12; C08f 45/58

U.S. Cl. 260—950 **8 Claims**

Aryl-polyol phosphites having terminal halide groups and their use as rubber stabilizers and/or anti-oxidants. The preferred embodiments are aryl-glycol phosphites having terminal halide groups.

3,666,842

PHOSPHONO THIOESTER AMIDATES

Paul C. Aichenegg, Prairie Village, Kans., assignor to Chemagro Corporation, Kansas City, Mo.

Continuation-in-part of application Ser. No. 620,664, Mar. 6, 1967. This application Dec. 31, 1969, Ser. No. 889,688

Int. Cl. C07f 9/44; A01n 9/36

U.S. Cl. 260—957 **12 Claims**

Compounds are prepared having the formula

where R_1 is trichloroethyl or dichlorovinyl, R_2 is lower alkyl or phenyl, R_3 is OR_4 or SR_4 or

where R_4 is alkyl, aryl, haloalkyl or haloaryl, R_5 and X is O or S. Preferably R_4 and R_5 are lower alkyl and R_6 is H or lower alkyl. The compounds are useful as nematocides, fungicides, and insecticides. Preferably R_1 is 2,2,2-trichloroethyl or 2,2-dichlorovinyl.

3,666,843

ALKYLARYLPOLYOXYALKYLENE ALKYL OR ARYL PHOSPHATES

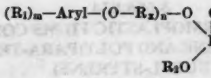
Ralph B. Fearing, Bardonia, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 23, 1968, Ser. No. 707,415

Int. Cl. C07f 9/18; D06l 1/04

U.S. Cl. 260—951 **10 Claims**

Compounds of the formula:



wherein R_1 is an alkyl radical of from one to 30 carbon atoms, R_2 is hydrogen, R_x is an alkylene group of from two to six carbon atoms, R_3 is an alkyl radical of from one to 10 carbon atoms or phenyl, n is an integer having a value of from 1 to 100, inclusive, m is an integer having a value of from 1 to 2, inclusive, -Aryl- is phenylene, and naphthylene and the sodium, potassium, ammonium and ethanol amino salts thereof which are useful as detergents and surfactants.

3,666,844

ALKYLARYLPOLYOXYALKYLENE N-HYDROXYALKYL PHOSPHORAMIDATES

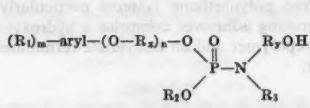
Ralph Fearing, Bardonia, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Feb. 23, 1968, Ser. No. 707,446

Int. Cl. C07f 9/22; C08g 22/44

U.S. Cl. 260—951 **12 Claims**

Compounds of the formula:



wherein R_1 is an alkyl radical of from one to 30 carbon atoms, R_2 is a lower alkyl and lower chloroalkyl, phenyl, benzyl, or R_1-Aryl-(O-R_x)$_n$-radical, R_3 is hydrogen, lower alkyl, phenyl, benzyl, or -R_yOH, R_x and R_y are alkylene bridges of from two to six carbon atoms, m is an integer of one or two, and n is an integer of from one to 100, and -Aryl- is phenylene, or naphthylene which are useful as dry-cleaning detergents.

3,666,845

PRODUCTION-SCALE FORMATION OF ULTRAHIGH PURITY CARBIDE POWDERS

Keith Vernon Davidson, and Donald H. Schell, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 6, 1970, Ser. No. 35,303

Int. Cl. G21c 21/00

U.S. Cl. 264—0.5 **3 Claims**

A method of forming ultrahigh purity carbide powders on a production scale which comprises blending metal oxide powders with elemental carbon powders and a partially polymerized furfuryl alcohol binder together with a suitable polymerization catalyst, extruding, polymerizing the binder, heating to 840° C for 48 hours in a soft vacuum, heating to 2,200° C for 1 hour in a helium atmosphere, cooling, crushing, and then heating to 2,000° C for 24 hours under a vacuum.

3,666,846

PROCESS OF FORMING AN ISOTOPIC HEAT SOURCE

Kenneth R. Sump; Ramon K. Robinson; Boyd D. Howard, and Kirk Drumheller, all of Richland, Wash., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 11, 1969, Ser. No. 816,482
Int. Cl. G21c 21/00
U.S. Cl. 264—0.5 9 Claims

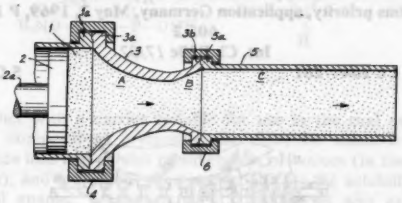
A process of encapsulating an alpha-emitting isotope to form an isotopic heat source. Microspheres are prepared, each containing its own helium gas plenum, an alpha-emitting isotope, and containment cladding. These microspheres are sealed in a capsule with or without a metal matrix.

3,666,847

METHOD AND APPARATUS FOR CONTROLLING ORIENTATION OF NEEDLE-LIKE CARBON PARTICLES IN EXTRUDED CARBONACEOUS STOCK

Bruce L. Bailey, Lewiston, N.Y., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed Nov. 7, 1969, Ser. No. 874,848
Int. Cl. B29f 3/04; C04b 35/54
U.S. Cl. 264—29 12 Claims



A means and method are provided for extruding compositions, particularly for extruding mixes of carbon and/or graphite particles and carbonizable binder. The means and method can additionally be employed to control the orientation of acicular particles in a composition during the extrusion thereof so as to control the properties of the extruded product.

In all cases, the extrusion die's internal configuration is defined by at least three sections comprising first a converging section, then a diverging section and then a final section of substantially constant cross-section. A section of substantially constant cross-section may also sometimes follow the converging section.

When employed in the extrusion of a carbonaceous mix containing needle-like carbon particles, dies of the present invention of appropriate design can be used to produce stock which after baking and graphitizing is characterized by having a transverse to longitudinal average coefficient of thermal expansion (CTE) ratio considerably less than that characteristic of corresponding stock in which the particles are all axially aligned.

3,666,848

METHOD OF PRODUCING CLOSED MOLD POLYURETHANE FOAM MOLDINGS FREE OF SURFACE VOIDS BY FLUSHING THE MOLD WITH A VAPORIZED HALOGENATED HYDROCARBON

Robert C. Harper, Loveland, Ohio, and Cincinnati Milling Machine Company, Cincinnati, Ohio

Filed Nov. 24, 1969, Ser. No. 879,507
Int. Cl. B29d 27/00
U.S. Cl. 264—39 11 Claims

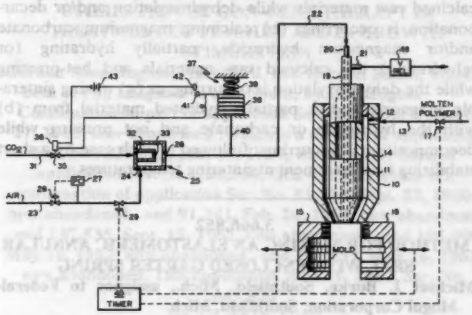
Foamed polyurethane moldings free of surface voids and having a substantially uniform skin are formed in a closed mold which has been purged of air with a vaporized liquid halogenated hydrocarbon capable of condensing on the mold walls or dissolving in the molding composition at the temperature and pressure conditions used in molding.

3,666,849

METHOD OF COOLING THERMOFORMED ARTICLES

George E. Williams, and Edward C. Held, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Original application Jan. 22, 1968, Ser. No. 699,525, now Patent No. 3,520,020. Divided and this application Apr. 3, 1970, Ser. No. 25,451
Int. Cl. B29c 17/07
U.S. Cl. 264—40 2 Claims



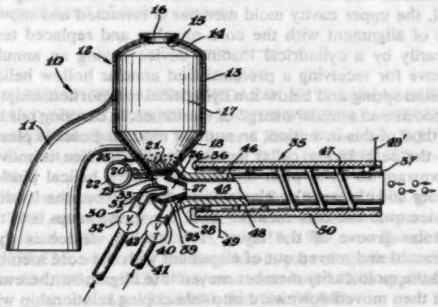
Cooling fluid, such as liquid carbon dioxide, is introduced into thermoformed articles to aid in cooling. A pressure switch in the blowing fluid conduit introduces the cooling fluid when the pressure of the blowing fluid reaches a first value and stops flow of the cooling fluid when a second higher pressure is reached.

3,666,850

PACKAGING METHOD AND APPARATUS

Leo J. Windecker, Midland, Tex., assignor to The Dow-Chemical Company, Midland, Mich.

Continuation of application Ser. No. 595,678, Nov. 21, 1966, now abandoned. This application July 10, 1969, Ser. No. 845,658
Int. Cl. B29d 9/00
U.S. Cl. 264—45 4 Claims



Method and apparatus are disclosed for packaging wherein expandable plastic particles are heated in an applicator gun

to a temperature sufficient to cause expansion and to cause softening of the surface. The particles are carried by a hot gas stream and deposited as a coherent mass about an object to be packaged.

3,666,851

PREPARING HIGH DENSITY MAGNESIA REFRACTORIES

Asoke C. D. Chaklader, Vancouver, British Columbia, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Nov. 10, 1969, Ser. No. 875,567
Int. Cl. C04b *35/64*
U.S. Cl. 264—66 **15 Claims**

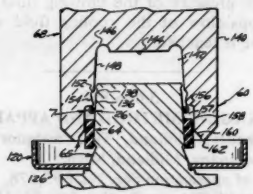
A method of preparing high density refractories of magnesia by one of (a) partially calcining magnesium carbonate and/or magnesium hydroxide, and hot pressing the partially calcined raw materials while dehydroxylation and/or decarbonation is occurring; (b) calcining magnesium carbonate and/or magnesium hydroxide, partially hydrating (or rehydrating) the calcined raw materials and hot-pressing while the dehydroxylation is occurring; or (c) mixing sinterable magnesia and/or partially hydrated material from (b) with the hydroxide or carbonate and not pressing while decomposition is occurring : followed in each case by a short stabilizing heat treatment at sintering temperatures.

3,666,852

METHOD FOR MAKING AN ELASTOMERIC ANNULAR SEAL WITH ENCLOSED GARTER SPRING

Michael J. Burke, Southfield, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jan. 6, 1970, Ser. No. 982
Int. Cl. B29d *3/00*; B29h *9/08*
U.S. Cl. 264—229 **1 Claim**



A mold assembly including an externally-tapered lower core member with an annular groove near the top and an annular shoulder and seat near the bottom and an internally-tapered upper cavity mold member cooperatively form an annular die cavity having the shape desired for the elastomeric annular seal to be formed therein. Prior to molding the seal, the upper cavity mold member is retracted and moved out of alignment with the core member and replaced temporarily by a cylindrical loading device having an annular groove for receiving a pre-tensioned annular hollow helical tension spring and below it a cylindrical end portion adapted to receive an annular charge of elastomer. In carrying out the method of this invention, an annular mounting case is placed on the seat and a collar on the loading device is moved downward so as to push the annular hollow helical tension spring and the annular elastomeric charge from the loading device onto the core member until the spring snaps into the annular groove of the latter. The loading device is then retracted and moved out of alignment with the core member and the mold cavity member moved into alignment therewith and then moved downward into telescoping relationship with the core member, moving the annular hollow helical tension spring downward and at the same time expanding and circumferentially stretching it to open up spaces between its convolutions.

As the spring is pushed downward, it pushes the elastomeric charge ahead of it into the mold chamber which shapes the seal and totally encloses the spring therein. Excess elastomer is ejected upward through the clearance between the mold and core members. Simultaneously therewith, the elastomer is pushed between the now-spaced convolutions of the expanded spring into the hollow of the spring, completely and uniformly filling it with elastomer. The upper mold cavity is then moved downward to the end of its stroke and an annular nose portion thereof cooperates with the shoulder as a fulcrum to bend the periphery of the case upward into a frustoconical flange which enters the mold chamber and becomes bonded to elastomer flowing against its opposite sides. The end of the stroke ordinarily cuts off any flash adhering to the upper end of the seal, forming a sharp sealing lip thereon. The elastomer of the seal is then cured in the mold cavity by heating the mold assembly, after which the completed seal is ejected from the core member by a conventional stripper as the mold cavity member is retracted upward.

3,666,853

METHOD OF MANUFACTURING A CONTINUOUS STRINGER FOR A SLIDING CLASP FASTENER

Ernst Popovitsch, Stuttgart-Steckfeld, Germany, assignor to Dr. Karl F. Nagele Feinmaschinenbau, Stuttgart-Hohenhein, Germany

Filed Apr. 30, 1970, Ser. No. 33,469
Claims priority, application Germany, May 2, 1969, P 19 22 605.2
Int. Cl. B29c *17/02*
U.S. Cl. 264—281 **5 Claims**

In manufacturing a continuous slide fastener stringer, a plastic wire is coiled into a helix abut a fixed mandrel, and the helix is withdrawn from the mandrel while its convolutions are braked on one side so that the helix is distorted. It is thereafter shaped on a heated spacing wheel, and each convolution is deformed by a toothed kinking disc. The stringer so formed has convolutions of periodically varying inclination and has alternating parallel shanks connected by inclined portions retaining the original coiling pitch and having protuberances which secure loops of sewing threads by means of which the stringer is attached to a supporting tape.

3,666,854

TEST FOR THYROID HORMONE

Anna M. Eisentraut, Dallas, Tex., assignor to Nuclear-Medical Laboratories, Inc., Dallas, Tex.

Filed July 30, 1969, Ser. No. 846,289
Int. Cl. A61k *27/04*
U.S. Cl. 424—1 **9 Claims**

A procedure utilized in a diagnostic test for determining the level of thyroid hormone within a body fluid which includes admixing a radioactive isotope labeled hormone with a body fluid, and separating the resulting unbound hormone from the hormone bound by the hormone binding globulin and protein of the fluid by sorption of the unbound hormone by a particulate inorganic crystalline material. This sorption does not depend upon critical time or temperature limitations, and is generally conducted by thoroughly admixing the sorbent material with the solution containing the bound and unbound thyroid hormone at room temperature. The sorbent material is then separated from the resultant supernatant

fluid and either the supernatant fluid or sorbent material, preferably the sorbent material, is counted with a scintillation counter to determine the labeled hormone bound to or free from the globulin.

3,666,855

ORAL COMPOSITIONS AND METHODS FOR RETARDING DENTAL CARIES AND CALCULUS

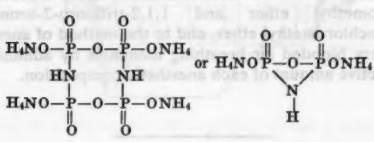
Joseph C. Muhler, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Continuation-in-part of application Ser. No. 535,022, Mar. 17, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 402,920, Oct. 9, 1964, now abandoned. This application Jan. 29, 1968, Ser. No. 701,067

Int. Cl. A61k 7/16

U.S. Cl. 424—52 12 Claims

Oral compositions may include in excess of 1 percent and up to about 40 percent of ammonium salts of condensation products of ammonia and phosphorus pentoxide, e.g.,



together with a carrier suitable for use in the oral cavity. Such compositions preferably also comprise stannous and fluoride ions and exhibit relatively low pH values (in the 4–5 range), and are highly effective in reducing the solubility of dental enamel. Moreover, such compositions also exhibit marked effectiveness in reducing the susceptibility of the teeth to the accumulation of dental calculus.

3,666,856

TREATING IMMUNE RESPONSE WITH AMINO PURINE DERIVATIVES

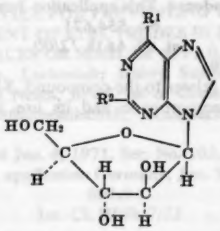
Gertrude B. Elion, Bronxville, N.Y., and Robert A. Strelitz, Edison, N.J., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C. and The Wellcome Foundation, Ltd., London, England

Filed Nov. 17, 1969, Ser. No. 877,443

Int. Cl. A61r 27/00

U.S. Cl. 424—180 4 Claims

Compounds of the formula



where R^1 is amino or lower alkylamino, R^2 is amino or hydrogen and pharmaceutically acceptable salts thereof, provided that when R^1 is amino, R^2 is amino. The compounds are useful as immune suppressants and as antivirals.

3,666,857

AQUEOUS COMPOSITIONS CONTAINING LANOLIN OIL

Kenneth L. Russell, Nutley, N.J., assignor to Malmstrom Chemical Corp., Linden, N.J.

Continuation of application Ser. No. 178,221, Mar. 1, 1962, now abandoned. This application Mar. 4, 1966, Ser. No. 531,756

Int. Cl. A61k 7/08

U.S. Cl. 424—240 7 Claims

A liquid fraction of lanolin is solubilized in water with a combination of (A) fatty acid soaps and/or synthetic detergents, (B) a polyoxyethylene ether of lanolin alcohol condensed with 16 mols of ethylene oxide, and (C) a higher fatty acid alkanolamide.

3,666,858

UTILIZATION OF GON-4-ENE THERAPY IN TREATMENT OF FEMALES AND IN GROWTH STIMULATION

Gordon Alan Hughes, Haverford, and Herchel Smith, Wayne, both of Pa., assignors to said Smith, by said Hughes

Continuation-in-part of application Ser. No. 489,077, Sept. 21, 1965, now abandoned, which is a division of application Ser. No. 337,823, Jan. 15, 1964, which is a division of application Ser. No. 228,384, Oct. 4, 1962, which is a continuation of application Ser. No. 51,904, Sept. 23, 1960, now abandoned, and 91,341, Feb. 24, 1961, now abandoned, and 137,535, Sept. 12, 1961, now abandoned, and 195,000, May 15, 1962, now abandoned, and 196,557, May 16, 1962, now abandoned. This application June 29, 1967, Ser. No. 649,800

Int. Cl. A61k 27/00

U.S. Cl. 424—243 13 Claims

Methods of using certain 13-ethyl-gon-4-enes are described, namely 13β,17α-diethyl-17β-hydroxygon-4-en-3-one, and the decanoate ester of 13β-ethyl-17β-hydroxygon-4-en-3-one for growth stimulation in mammals; and 13β-ethyl-17α-ethynyl-17β-hydroxygon-4-en-3-one, to treat dysfunctions of the female reproductive system in mammals, to control cyclic regularity, and to prevent conception in female mammals.

3,666,859

3,4-DICARBETHOXY-β-PHENETHYLCARBAMIC ACID, ETHYL ESTER IN TREATING DEPRESSION

Nicholas Peter Plotnikoff, Lake Bluff, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 9, 1970, Ser. No. 96,618

Int. Cl. A61u 27/00

U.S. Cl. 424—300 2 Claims

A method of treating the symptoms of depression comprising administering a therapeutically effective amount of 3,4-dicarbethoxy-β-phenethylcarbamic acid, ethyl ester to patients in need of such treatment.

3,666,860

SUBSTITUTED NITROIMIDAZOLYLTHIADIAZOLES AND OXADIAZOLES AS ANTIPROTOZOAL AGENTS

Gerald Berkelhammer, 147 Laurel Road, Princeton, N.J., and Goro Asato, Maddock Road, R.D. 1, Box 299C, Titusville, N.J.

Continuation-in-part of application Ser. No. 814,160, Apr. 7, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 659,596, Aug. 10, 1967, now Patent No. 3,452,035, which is a continuation-in-part of application Ser. No. 604,158, Dec. 23, 1966, now abandoned. This application Apr. 22, 1970, Ser. No. 30,944

Int. Cl. A61k 27/00

U.S. Cl. 424—270 10 Claims

The use of substituted nitroimidazolyl-thiadiazoles and oxadiazoles are described along with methods of administration

of the same. These compounds have been found useful in controlling protozoa and therefore, are antiprotozoal agents.

3,666,861

METHODS FOR TREATING MIGRAINE WHICH USE 2-(2',6'-DICHLOROPHENYL-AMINO)-1,3-DISZACYCLOPENTENE-(2)

Eleanor Zaimis, and Edda Hanington, both of London, England, assignors to Bochringer Ingelheim GmbH, Ingelheim/Rhine, Germany

Filed June 3, 1970, Ser. No. 43,197
Claims priority, application Germany, June 6, 1969, P 19 28 798.0
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 4 Claims

Pharmaceutical compositions for the treatment of the syndrome known as hemicrania or migraine, comprising 2-(2',6'-dichlorophenyl-amino)-1,3-diazacyclopentene-(2) or a non-toxic acid addition salt thereof as an active ingredient; and a method of treating hemicrania or migraine in humans with such compositions.

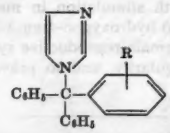
3,666,862

N-TRITYL-IMIDAZOLES AS PLANT FUNGICIDES

Karl-Heinz Buchel, Wuppertal-Elberfeld; Erik Regel, Wuppertal-Cronenberg; Ferdinand Grewe, Burscheid; Hans Scheinpflug, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Farbenfabriken Bayer A.G.

Original application Jan. 7, 1969, Ser. No. 789,601. Divided and this application Sept. 2, 1970, Ser. No. 69,109
Claims priority, application Germany, Jan. 29, 1968, P 16 70 976.5
Int. Cl. A01n *9/22*
U.S. Cl. 424—273 5 Claims

Plant fungicidal compositions are produced which comprise an amount of a compound of the formula:



wherein R is cyano, sufficient to be effective for killing, combatting or controlling plant fungi, in combination with a solid or liquid diluent or carrier. Methods for killing, combatting or controlling fungal diseases in plants comprise applying to the fungi or to the plant to be protected an effective or toxic amount of the above compound.

3,666,863

SKIN-TREATING COMPOSITION AND VEHICLE FOR SKIN-TREATING AGENTS

Gunnar P. E. Swanbeck, Vaxholm, Sweden, assignor to Medisan AB, Uppala, Sweden

Filed Mar. 4, 1969, Ser. No. 804,261
Claims priority, application Sweden, Mar. 6, 1968, 2977/68
Int. Cl. A61k *27/00*
U.S. Cl. 424—316 13 Claims

The present invention relates to a skin-treating composition comprising an aqueous phase in which urea and lactic acid are dissolved. Optionally, the composition of the invention may comprise a lipid phase, wetting or emulsifying agents and amino acids. The composition is per se beneficial for the treatment of certain abnormal skin conditions; it is also an excellent vehicle for therapeutically active drugs for the treatment of pathological skin conditions.

3,666,864

COMPOSITIONS AND METHODS FOR PRODUCING ANESTHESIA

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 877,031, Nov. 14, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 712,903, Mar. 14, 1968, now abandoned, and 712,912, Mar. 14, 1968, now abandoned. This application Aug. 31, 1970, Ser. No. 68,474
Int. Cl. A61k *13/00*
U.S. Cl. 424—342 6 Claims

The present invention relates to anesthetic compositions containing 1,1,2-trifluoro-2-chloro-2-bromoethyl difluoromethyl ether and 1,1,2-trifluoro-2-bromoethyl difluorochloromethyl ether, and to the method of anesthetizing warm blooded air breathing mammals by administering an effective amount of each anesthetic composition.

3,666,865

STABILIZED TRANS-DIETHYLSTILBESTROL FORMULATIONS

Nelson H. Ludwig, Greenfield, Ind., assignor to Eli Lilly and Compnay, Indianapolis, Ind.

Continuation-in-part of application Ser. No. 852,908, Aug. 25, 1969, now abandoned. This application May 13, 1970, Ser. No. 37,003
Int. Cl. A61k *27/00*
U.S. Cl. 424—346 8 Claims

The isomerization of trans-diethylstilbestrol to the inactive cis isomer in animal feed compositions is substantially inhibited by the addition of the combination of a phenolic antioxidant compound and a nitrogen compound or a base or basic salt.

3,666,866

INHALATION ANESTHETIC

Harry Louis Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of application Ser. No. 365,173, May 5, 1964, now abandoned. This application June 2, 1966, Ser. No. 554,671
Int. Cl. A61k *13/00*
U.S. Cl. 424—350 9 Claims

This invention relates to the compound, 3-bromo-3-chloro-1,1,1,2,2-pentafluoropropane and its use as an inhalation anesthetic.

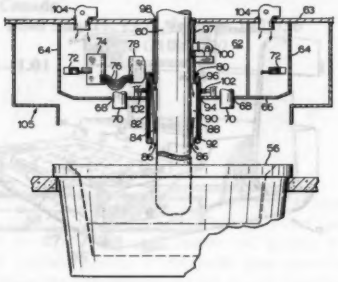
ELECTRICAL

3,666,867

SMELTING FURNACE

Frank Walter Shaw, Welland, Ontario, Canada, assignor to Union Carbide Canada Limited, Toronto, Ontario, Canada

Filed Apr. 28, 1971, Ser. No. 138,224
Int. Cl. F27d *11/08*; H05b *7/10, 7/12*
U.S. Cl. 13—9 **4 Claims**



An electric smelting furnace of the open hearth type suitable for producing ferrosilicon alloy and the like is described which has improved operating efficiency and heat and dust shielding of the electrical components. The furnace includes an open hearth for containing the melt, at least one carbon electrode extending vertically into the melt and an enclosed space suspended above the furnace and enclosing the upper portion of the electrode. Current-carrying interlaced conductors extend through the enclosed space to a point adjacent the upper portion of the electrode and are connected by means of flexible conductors to vertical conductors which extend to contact plates positioned around the electrode between the enclosed space and the melt. A water-cooled jacket forms an annular chamber around the vertical conductor. Super-atmospheric pressure is maintained within the enclosed space to thereby preclude the entry of airborne foreign particles into the enclosed space.

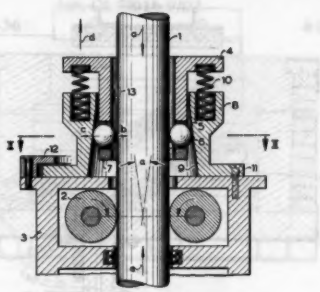
3,666,868

SAFETY DEVICE FOR PREVENTING THE RETURN MOVEMENT OF ELECTRODES IN ELECTRIC FURNACES OR SIMILAR APPARATUSES

Herbert Pusche, Lechenich; Harry Sander, Sindorf, and Hans-Wilhelm Neuss, Bruhl, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Filed Jan. 4, 1971, Ser. No. 103,644
Claims priority, application Germany, Jan. 9, 1970, P 20 00 801.9
Int. Cl. H05b *7/12*
U.S. Cl. 13—15 **9 Claims**

Safety device for preventing the return movement of electrodes in electric furnaces and similar furnaces or plasma burners. The safety device comprises a sleeve and a holder. The safety device comprises a sleeve and a holder. The holder is secured to the upper part of a furnace and the sleeve, supported by the holder, concentrically encircles the individual electrodes. The sleeve is formed with bores which



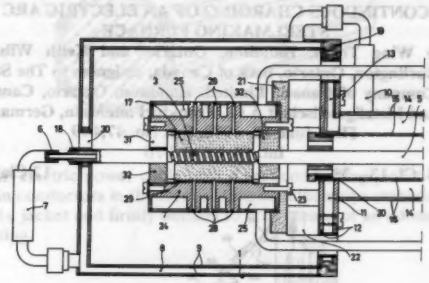
receive electrode-clamping elements which clampingly cooperate with the electrode and the holder.

3,666,869

METHOD AND APPARATUS FOR SETTING UP A TEMPERATURE GRADIENT

Luigi Orecchia, Gavirate, Italy, assignor to European Atomic Energy Community (Euratom), European Center Kirchberg, Luxembourg

Filed Feb. 2, 1970, Ser. No. 7,847
Claims priority, application Italy, Feb. 1, 1969, 34662 A/69
Int. Cl. H05b *5/00*
U.S. Cl. 13—20 **9 Claims**



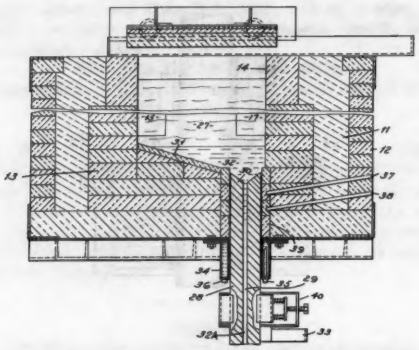
A method and apparatus for setting up a temperature gradient across a hollow member which is a good conductor of heat such as uranium carbide testpiece of simulate the thermal conditions of fuel inside a nuclear reactor. A uranium carbide hollow member has a high frequency AC heating means inside it and a cooling jacket surrounding it to provide a temperature gradient of approximately 450° C.

3,666,870

SALT BATH FURNACE FOR COPPER RECLAMATION

Eugene L. Kemper, Mt. Clemens, Mich., assignor to Upton Industries, Inc., Roseville, Mich.

Filed Apr. 19, 1971, Ser. No. 135,299
Int. Cl. H05b 3/60
U.S. Cl. 13—23 10 Claims



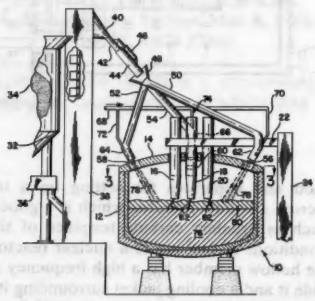
The invention relates to an electric salt bath furnace for reclamation of copper or other nonferrous metal from ferrous or other higher melting scrap containing the same. A standard type or ceramic lined salt bath furnace having electrodes for passage of current through the bath is provided with an additional electrode at the floor of the furnace. Said electrode has a discharge conduit within the same through which the molten metal is withdrawn, emerging therefrom as solid metal. During initiation of the molten metal discharge, the temperature of the entrance end of the conduit is maintained above the melting point of the metal by the heating effect of the current through the floor electrode. During the casting, the current through the floor electrode is discontinued to avoid overheating and the electrode is discontinued to avoid overheating and the electrode can be water cooled, if necessary. Sensors, preferably thermocouples, are arranged in proximity to said floor electrode to measure the temperature and to control heating and cooling of the metal passing through the discharge conduit.

3,666,871

CONTINUOUS CHARGING OF AN ELECTRIC ARC STEELMAKING FURNACE

Gee Wing Thom, Hamilton, Ontario, and Keith Wilson, Burlington, Ontario, both of Canada, assignors to The Steel Company of Canada Limited, Hamilton, Ontario, Canada and Metallgesellschaft A.G., Frankfurt am Main, Germany

Filed June 18, 1970, Ser. No. 47,449
Int. Cl. F27d 3/10
U.S. Cl. 13—33 12 Claims



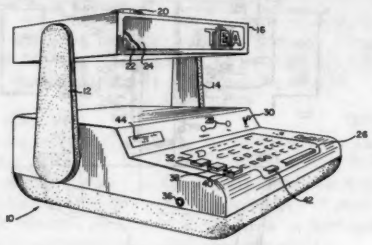
A method of steelmaking in a three phase direct arc electric furnace having a slag covered bath of molten iron bearing metal. The furnace is charged through its roof by at least three ducts and includes propelling means for directing the charge toward the bath at an angle to the horizontal in the range 40–80°.

3,666,872

TEACHING MACHINE

Carroll E. Powell, 6501 Camden Avenue, Indianapolis, Ind., and Clinton L. Carter, 9510 East Southport Road, Indianapolis, Ind.

Filed Oct. 23, 1970, Ser. No. 83,447
Int. Cl. G09b 7/04
U.S. Cl. 35—9 A 9 Claims



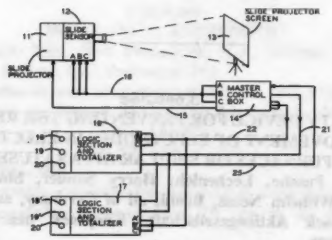
A teaching device having a film projector, a keyboard, a memory tape unit and logic circuitry for providing audio and visual presentations for instructional purposes. The presentation may consist of a word or object displayed on a screen which the user would identify by pressing keys on the keyboard. This response is compared with the correct one as coded on a segment of film. The memory tape unit records any auditory presentation and any spoken response by the user for comparison purposes, such as would be desired for learning of a language. Many presentations of the ways in which the machine is used permits it to be adapted to the proficiency of each user.

3,666,873

SELECTION APPARATUS AND CIRCUITRY

Ralph M. Pincus, 384 Elliot Place, Paramus, N.J.

Filed Mar. 16, 1970, Ser. No. 19,742
Int. Cl. G09b 5/00
U.S. Cl. 35—48 R 20 Claims



This invention is related to a method, apparatus and circuitry for enabling various competitors to determine between themselves and by virtue of a counting apparatus the correctness or incorrectness of the selection or the time required to make the selection of some display events or the like of which one display is correct and the others incorrect.

The selections are controlled from consoles each having a number of selector units corresponding to the number of possible choices from any intelligence displayed. A correct choice from one control unit in any one console will tem-

porarily inhibit all other consoles through a master control unit and a registration of the correct selection will be made.

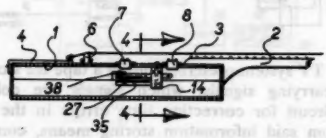
In a preferred form the invention provisions can be made whereby reponse time testing can be utilized, as well as aptitude testing, for those individuals operating at different consoles. The apparatus is particularly adapted for educational purposes, aptitude testing, scholastical testing, response time testing and serves as programmable teacher for numerous purposes.

3,666,874

TUNING FORK FOR ELECTRICALLY AMPLIFIED STRING INSTRUMENTS

Clement Labbe, 7600 Molson Street, Apt. 26, Montreal 453, Quebec, Canada

Filed May 27, 1971, Ser. No. 147,336
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **11 Claims**



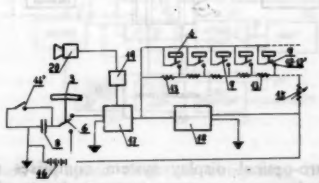
A tuning fork is mounted inside the body of an electric guitar or the like electric string instrument, adjacent a microphone thereof and manual means are provided to set the tuning fork in vibration. The sound emitted thereby is amplified by the sound amplifying system of the musical instrument, so as to be clearly audible by the musician, even when exposed to noise or sounds of other instruments in an orchestra or other music ensemble. The tuning of the instrument is therefore much facilitated. The sound emitted by the tuning fork can be easily adjusted as to its volume. The tuning fork can be stopped from vibrating. The assembly can be mounted in any existing type of electric guitars, mandolins, banjos, violins and the like electronically sound amplified string instruments having a microphone underneath the strings and mounted in the sound board.

3,666,875

ELECTRONICALLY OPERATED STRINGED INSTRUMENTS

Mario Ranzato, Via Amendola n. 2/2, 17100 Savona, Italy

Filed July 7, 1970, Ser. No. 52,960
Claims priority, application Italy, July 11, 1969, 49303 A/69; June 10, 1970, 12735 A/70
Int. Cl. G10h *3/00*
U.S. Cl. 84—1.13 **3 Claims**



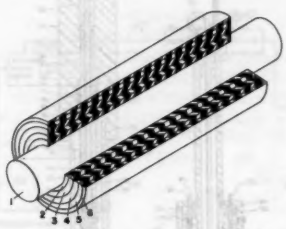
Stringed instruments such as the guitar, mandolin, contrabass and piano are operated electronically instead of by hand, plectrum or percussion. Circuitry is provided for operation and control. The instruments are otherwise conventionally constructed.

3,666,876

NOVEL COMPOSITIONS WITH CONTROLLED ELECTRICAL PROPERTIES

Eric O. Forster, Scotch Plains, N.J., assignor to Esso Research and Engineering Company

Continuation-in-part of application Ser. No. 678,655, Oct. 27, 1967, now abandoned. This application July 17, 1970, Ser. No. 55,776
Int. Cl. H01b *9/02*
U.S. Cl. 174—36 **4 Claims**



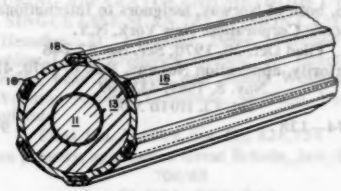
An electrical conductor shielded with an insulating coating comprising a semi-conductive material of a polymer having a dielectric constant of at least 2.0 and a filler selected from the group consisting of electrically conductive metals and their alloys, said filler having a particle size range of about 0.05 to about 50 microns, said particles having an approximately linear distribution of particle size with an average particle size of about 1 to about 20 microns.

3,666,877

SHIELDED CABLE

Edwin H. Arnaudin, Jr., Eden, N.C., and William F. Morrison, Marion, Ind., assignors to Anaconda Wire and Cable Company

Filed May 10, 1971, Ser. No. 141,905
Int. Cl. H01b *9/02*
U.S. Cl. 174—115 **8 Claims**



An electric power cable with a semiconducting jacket has drain conductors in the form of thin metallic strips embedded in the jacket and firmly bonded to it by means of an adhesive coating.

3,666,878

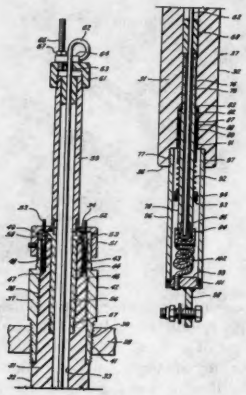
HIGH-VOLTAGE ENTRANCE BUSHING FOR AN ELECTRIC TREATER

Delber W. Turner, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Aug. 19, 1971, Ser. No. 173,198
Int. Cl. H01b *17/26*
U.S. Cl. 174—152 R **18 Claims**

An entrance bushing for an electric treater subject to high voltage, temperature and pressure operating conditions. The bushing mounts in the treater by a threaded adapter on one end of an interiorly extending cylindrical Teflon member. First and second sleeves with closed ends are threaded into

the member to extend coaxially from a longitudinal passage receiving an electrical conductor connected between an external power source and internal electrical treater components. Any fluid leaking between the adapter and member is vented exteriorly of the first sleeve and passage. The second sleeve is permanently bonded and sealed to the



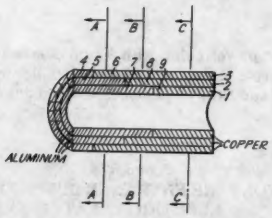
member by a polymer sealing element (fluorinated ethylene propylene resin) compressed between interengaged threads to exclude voids and mechanical-thermal induced seal disruption. A third sleeve encloses the second sleeve with an electrical interconnection provided by a flexible lead to isolate the sealing element from mechanical impacts.

3,666,879

POWER CABLE

Christian Worm Hirsch, Lysakfr, and John Normann Johnsen, Oslo, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 20, 1970, Ser. No. 82,248
Claims priority, application Norway, Feb. 6, 1970, 417/70; Nov. 8, 1969, 4437/69
Int. Cl. H01b *5/08*
U.S. Cl. 174—128 **9 Claims**



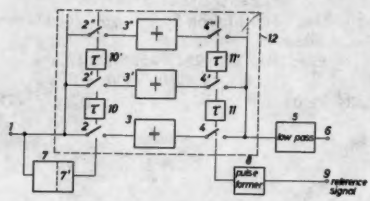
The geometric dimensions and power losses of a power cable are maintained constant along its length, notwithstanding changing ambient thermal conditions. This is made possible by changing the conductor material at different locations, for example, copper to aluminum, having different thermal resistivity. The sections of different conductor material are joined by conventional techniques such as welding, soldering, etc. Copper is used at the ends to simplify splicing.

3,666,880

CIRCUIT ARRANGEMENT FOR THE CORRECTION OF TIME ERRORS IN ELECTRICAL SIGNALS RECEIVED FROM AN INFORMATION CARRIER

Gerhard Krause, Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Apr. 25, 1969, Ser. No. 819,177
Claims priority, application Germany, May 20, 1968, P 17 74 302.1
Int. Cl. H04n *9/02*
U.S. Cl. 178—5.2 R **10 Claims**



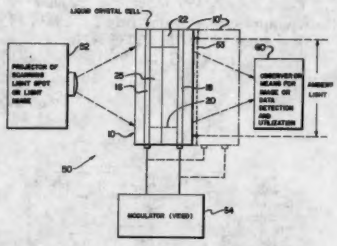
In a color TV system preferably using a tape for storing information carrying signals, which signals are color TV signals, a circuit for correcting time errors in the signals removed from said information storing means, comprising storage means, means for producing read-in pulses from the color burst of the TV signals, the read-in pulses containing said time errors, switch means connecting the read-in pulse producing means to the storage means for inserting the instantaneous value of the information carrying signals into the storage means at the rate of the read-in pulses, means for producing read-out pulses from a reference signal which is free from such time errors, switch means connecting the read-out pulse producing means to the storage means for reading out the information in the storage means at the rate of the read-out pulses and output means for receiving the time-error free information containing signals.

3,666,881

ELECTRO-OPTICAL DISPLAY DEVICE EMPLOYING LIQUID CRYSTALS

Richard J. Stein, 5 Elm Street, Great Neck, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,602
Int. Cl. H04n *9/12;* **G02f** *1/28*
U.S. Cl. 178—5.4 BD **12 Claims**



An electro-optical display system comprises a display screen including one or more juxtaposed sets of nematic liquid crystal and photoconductive layers bounded by transparent electrodes. The screen is scanned by scanning light while modulated bias voltages are applied across the liquid crystal and photoconductive layers. Images appearing on the screen are viewable by reflected ambient light to which the photoconductive layers are transparent. Colored dyes mixed with the nematic liquid crystals result in colored images on

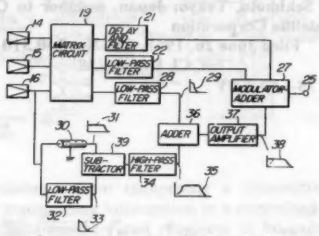
the screen. Cholesteric liquid crystal mixed with the nematic liquid crystal retains the images on the screen for predetermined periods of time. The images are viewable at either side of the screen. The screen can be internally illuminated.

3,666,882

COLOR TELEVISION PICK-UP DEVICE WITH SYNTHESIZED LUMINENCE SIGNAL

Shigeru Nishimura, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 25, 1969, Ser. No. 844,936
Claims priority, application Japan, July 31, 1968, 43/54728
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.4 TC **4 Claims**



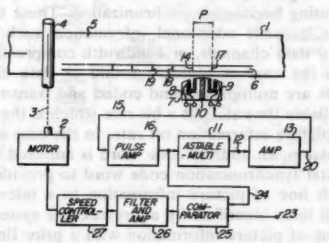
A pick-up device composed of three, "red," "green" and "blue" pick-up tubes without using any luminance signal pick-up tube, wherein a "green" signal is employed as a luminance signal in view of the fact that the "green" signal characteristic is represented by a curve similar to a human visibility curve, and wherein the apparent horizontal resolution can be prevented from being decreased even when signals available from the three pick-up tubes are deviated from each other due to unsatisfactory registration of these signals.

3,666,883

SPEED DETECTION AND CONTROL

Osahiko Yano, Kadoma; Takahiro Nakamura, Neyagawa, and Masahiro Deguchi, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 30, 1970, Ser. No. 33,265
Claims priority, application Japan, May 8, 1969, 44/36860; May 30, 1969, 44/43793; June 10, 1969, 44/46665
Int. Cl. G11b *5/26, 15/52;* H04n *5/78*
U.S. Cl. 178—6.6 P **8 Claims**



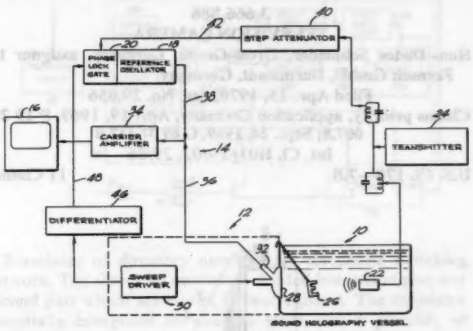
A method of speed detection comprising the steps of recording pulse signals in a travelling tape or rotating body of magnetic material with an equal distance and reproducing the recorded pulse signals to detect the speed of the tape or the body. Speed control utilizing the above detection means comprises the step of comparing the phases of said reproduced pulse signals and a reference signal of a predetermined frequency to control the tape or body to move at a predetermined speed.

3,666,884

ELECTRONIC SIMULATION OF VARIABLE INCLINATION REFERENCE BEAM FOR ACOUSTICAL HOLOGRAPHY

Harold L. Chambers, Royal Oak; Emanuel Marom, Oak Park, and Rolf K. Mueller, Brighton, all of Mich., assignors to The Bendix Corporation

Filed Jan. 24, 1969, Ser. No. 793,777
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **9 Claims**



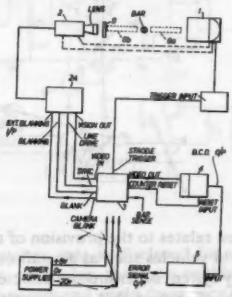
A method and apparatus for electronically simulating a plane wave reference beam of variable inclination for use in an acoustical holography system. The invention is based on the principle that the phase of a plane wave changes linearly over the plane of detection. In systems where the detection is obtained by scanning the aperture in the plane of detection, as in certain acoustical holography setups, the required reference beam simulating a plane wave can be generated by an electronic signal having a frequency slightly different from the one used to irradiate the object. The apparatus can be adjusted to obtain a simulated reference beam of any desired angle of incidence up to 90°.

3,666,885

MEASURING APPARATUS AND METHODS UTILIZING A SINGLE LINE SCAN TELEVISION CAMERA

Brian Hemsley, 71, Crimicar Drive, Fulwood Sheffield, Yorkshire; Lionel Frederick Hinbest, 53, Grenfolds Road, Grenoside, near Sheffield, and Joseph William Marshall, 55, Wollaton Avenue, Broadway, Sheffield, Yorkshire, all of England

Filed Jan. 3, 1969, Ser. No. 826,734
Claims priority, application Great Britain, Jan. 4, 1968, 700/68
Int. Cl. H04n *7/02, 7/18*
U.S. Cl. 178—6.8 **15 Claims**



Method of detecting a dimension of an elongated vibrating object being rolled, using a television camera, which method

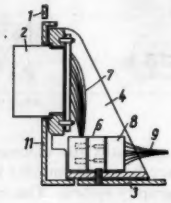
comprises periodically directing a light pulse onto an object to form a shadow image thereof in the camera, temporarily stopping the scanning beam of the camera for a period including an interval immediately following each pulse, repeatedly scanning the beam in the direction to be measured to provide video signals from successive lines, selecting a video signal corresponding to one line during each interval when the beam is operative, and deriving from the selected signal another signal having a value representative of the dimension to be measured.

3,666,886

TELEVISION CAMERA

Hans-Dieter Schneider, Gross-Gerau, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed Apr. 15, 1970, Ser. No. 29,056
Claims priority, application Germany, Apr. 19, 1969, P 19 20 007.8; Sept. 24, 1969, G 69 37 417.0
Int. Cl. H01j *29/02, 29/86*
U.S. Cl. 178—7.8 **11 Claims**



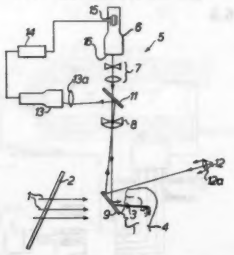
The television camera is disposed in a housing which has a recess for receiving a detachable adapter for a disconnectable junction cable of the camera. The camera plug is connected to a plurality of flexible leads, and projects loosely into the recess. The cable adapter comprises a bracket which supports a cable connector plug and an adapter socket. The camera plug is inserted in the adapter socket which is electrically connected with the cable connector plug.

3,666,887

HEAD-UP DISPLAYS

Michael H. Freeman, Denbigh Court, England, assignor to Pilkington Perkin-Elmer Limited, Liverpool, England

Filed June 24, 1979, Ser. No. 836,048
Claims priority, application Great Britain, June 29, 1968, 31,225/68
Int. Cl. H04n *7/02*
U.S. Cl. 178—7.85 **6 Claims**



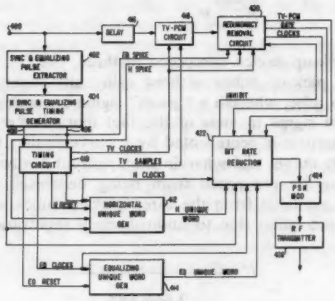
This invention relates to the provision of a head-up display system for use in vehicles such as aircraft or land vehicles. A head-up display system superimposes selected visual information on the field of view so that an observer can see not only the view but also the visual information without having to look down at a dial or the like. In the present system there is provided a source of light information signals and means for superimposing an image of the said signals on the field of view of the observer together with means for detecting any angular displacement of the superimposed image with respect to a predetermined position and for producing a control signal proportional to the displacement. Finally there is provided a means responsive to the control signal to adjust the orientation of the light information signals so that the position of the signals in the image viewed by the observer remains more or less constant.

3,666,888

PCM-TV SYSTEM USING A UNIQUE WORD FOR HORIZONTAL TIME SYNCHRONIZATION

Tadahiro Sekimoto, Tokyo, Japan, assignor to Communications Satellite Corporation

Filed June 26, 1968, Ser. No. 740,310
Int. Cl. H04n *5/38*
U.S. Cl. 178—69.5 TV **16 Claims**

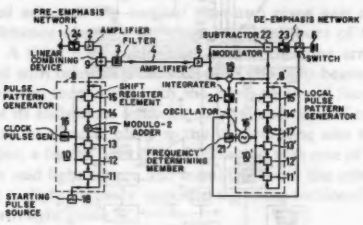


In a communication system for transmitting and receiving television information by means of digital codes, the horizontal sync pulses are transformed into a code word, thus leaving time slots in the transmitted waveform which are unoccupied by the digital picture information or the code word representing horizontal synchronization. These time slits are used to transmit additional information such as multiple sound or data channels, or bandwidth compression information. In the case of multiple sound or data channels, the channels are multiplexed and coded and transmitted during the available time slots at a bit rate which is the same as the digital picture information bit rate. In the case of bandwidth compression, an address code word is annexed to the single horizontal synchronization code word to provide an address for each line of picture information in a television frame. With all lines identified by addresses, the system compares each line of picture information with a prior line of picture information having the same address and transmits to the receiver only those lines which represent changes of a certain degree from a prior frame. As a result, redundant picture information is not transmitted thereby reducing the total amount of information transmitted, allowing the transmitter to operate at a reduced bit rate. The receiver stores all lines of information and the storage is up-dated by the received non-redundant lines of picture information. During each frame period, the receiver extracts from storage the redundant lines necessary to complete a picture frame.

3,666,889
TRANSMISSION SYSTEM

Leon Eduard Zegers; Jan Kuilman, and Wilfred Andre Maria Snijders, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of application Ser. No. 663,783, Aug. 28, 1967, now abandoned. This application July 30, 1970, Ser. No. 64,121
Claims priority, application Netherlands, Aug. 27, 1966, 6612113; Feb. 24, 1967, 6702874
Int. Cl. H04j 9/00
U.S. Cl. 179—15 BM 27 Claims

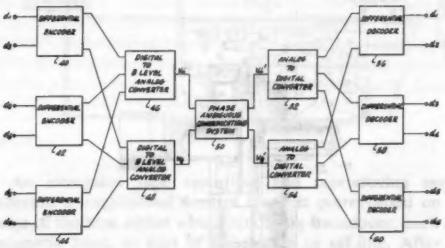


A transmission system comprising a transmitter and a receiver for transmitting information in a prescribed frequency band and transmitters and receivers to be used in said system. The transmission of the information signals may in particular be effected directly or after modulation, for example, amplitude modulation, frequency modulation or pulse modulation. The overall information to be transmitted originates from a main information source and an associated auxiliary information source having a smaller information content than the main information source.

3,666,890
DIFFERENTIAL CODING SYSTEM AND METHOD

Fred B. Wade, Ventura, Calif., assignor to American Data Systems, Inc., Canoga Park, Calif.

Filed Nov. 27, 1970, Ser. No. 93,429
Int. Cl. H04j 3/04
U.S. Cl. 179—15 AP 30 Claims

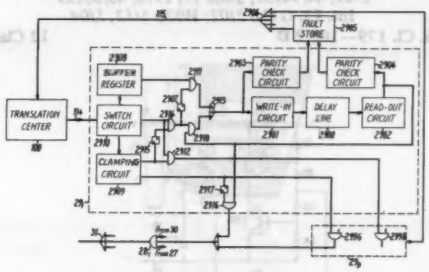


A differential coding system and method for use in a data communications system employing phase ambiguous coherent detection. The system and method includes differentially encoding a plurality of dibits through a plurality of differential encoders and corresponding outputs of the encoders into new dibit combinations before converting the new combinations to analog signals for transmission. In the receiving decoder, the process is reversed to recover the original dibits.

3,666,891
TRANSLATOR UNIT FOR TELEPHONE EXCHANGE

Christian H. Le Bellec, 21, rue Joseph Morand, Lannion, France

Filed June 29, 1970, Ser. No. 50,804
Claims priority, application France, June 30, 1969, 6922060
Int. Cl. H04q 3/47
U.S. Cl. 179—18 ET 2 Claims

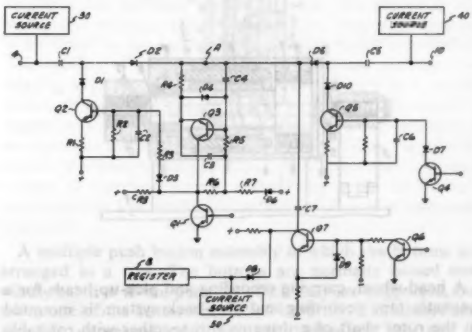


Translator of directory numbers for telephone switching network. The directory number is divided into a first part and second part which are stored in two registers. The translator essentially comprises an analysis store and a plurality of translation stores which are circulating stores all synchronous with one another. The analysis store has written therein all the values assumable by the first part number and the second part number and, associated with each of said values, the address of a given translation store. Two comparisons are made, the first between the first part of the directory number to be translated and its assumable values which results in the selection of the translation store having as its address the address associated with said first part. The second comparison is between the second part of the directory number to be translated and its assumable values which results in a read-out signal applied to the selected translation store.

3,666,892
SPEECH GATE

Alfred M. Hestad, Chicago, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 13, 1970, Ser. No. 36,785
Int. Cl. H04q 1/28
U.S. Cl. 179—77 8 Claims

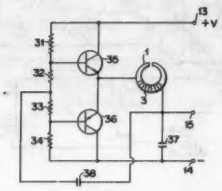


An audio frequency gate is disclosed for use in an electronic PABX. In particular, the gate enables the efficient transmission of speech and multi-frequency tones between components which are controlled by dc potentials without disrupting associated dc controls.

3,666,893
MAGNETIC ERASER WITH HEAD WINDING AS PART OF OSCILLATOR CIRCUIT

Tatsuo Fujiwara, Tokyo, and Hiromi Kusakabe, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 22, 1970, Ser. No. 74,259
Claims priority, application Japan, Sept. 25, 1969, 44/76103; Nov. 12, 1969, 44/90053; Nov. 19, 1969, 44/109195; Oct. 3, 1969, 44/94139; June 19, 1970, 45/53129
Int. Cl. G11b *5/02*; H03b *5/12*, *5/04*
U.S. Cl. 179—100.2 D 12 Claims

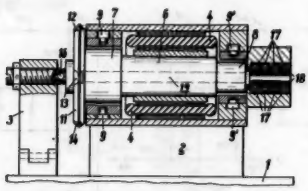


A magnetic eraser for tape recorders wherein there are received in a single casing an erase head provided with an erase coil and an oscillator for supplying the erase head with erase current using the erase coil concurrently as an oscillation coil. The circuit includes at least two transistors and a plurality of resistance elements which are interconnected so as to be particularly suitable for construction by integrated circuit techniques, the circuit being connected to the erase coil at least by a pair of capacitors.

3,666,894
DEVICE FOR THE RECORDING AND PLAYBACK OF SIGNALS ON MAGNETIC TAPE

Rudolf Prochnow, Darmstadt-Eberstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Continuation of application Ser. No. 786,872, Dec. 26, 1968, now Patent No. 3,591,732. This application Jan. 19, 1971, Ser. No. 107,644. The portion of the term of the patent subsequent to July 6, 1988, has been disclaimed
Int. Cl. G11b *5/50*
U.S. Cl. 179—100.2 T 5 Claims

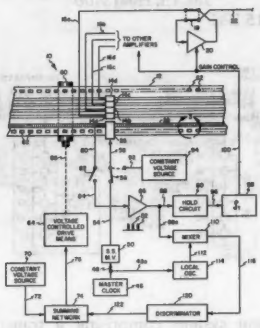


A head-wheel, carrying recording and pick-up heads for a magnetic tape recording and play-back system, is mounted on the rotor shaft of a drive motor, together with rotatable electric signal transfer means to constitute a rotor assembly which can be, as a unit, axially separated from the stator of the drive motor for the rotor assembly. The rotatable signal transfer means of the rotor are disposed in proximity of the head-wheel and have a stepped bearing dimension fitting into the supporting bearing of cooperating stationary signal transfer means of the stator.

3,666,895
FILM RECORDED VELOCITY AND DYNAMIC GAIN CONTROL MECHANISM

John C. McKechnie, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 9, 1971, Ser. No. 122,400
Int. Cl. G11b *7/00*, *15/44*, *77/32*
U.S. Cl. 179—100.3 D 5 Claims

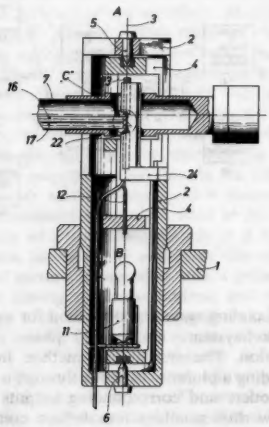


A film drive seed and gain regulated record and playback apparatus records a control track simultaneously with other parallel data tracks. The control track comprises a series of bars recorded at a predetermined frequency and having density representing the dynamic gain range of the recorded data. After processing, the control track is monitored and variations in density utilized to produce playback gain control signals for maintaining system dynamic range. Frequency of the bars during playback is compared with a known frequency by a mixer and a discriminator to provide speed control voltage signals.

3,666,896
LIGHT ELECTRIC TONE PICKUP

Eckhard Laue, St. Georgen, Black Forest, Germany, assignor to Dual Gerbruder Steidinger, St. Georgen, Black Forest, Germany

Filed Nov. 25, 1969, Ser. No. 879,693
Claims priority, application Germany, Nov. 26, 1968, P 18 10 984.7
Int. Cl. G11b *3/10*; H04r *5/00*, *23/00*
U.S. Cl. 179—100.4 R 3 Claims



In a light electric tone pick-up, a tone arm, which comprises an immovable tone arm holding member which holds

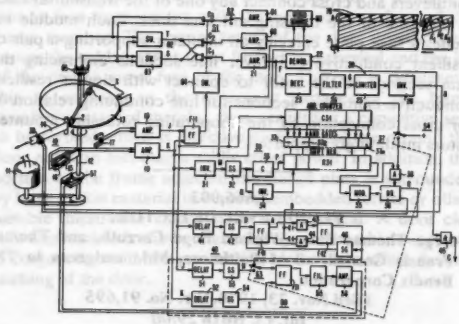
the tone arm at one end pivotally about a vertical and a horizontal axis. A light beam control is disposed at the other end of the tone arm and is connected with a sensing needle for a tone modulated groove. A light source is immovably disposed adjacent to the vertical tone-arm pivot axis. A first and a second light guide is secured in the tone arm, and each is directed with the cross-sectional face of one of its ends towards the light-beam control member and terminates with the cross-sectional face of the other of its ends close to the horizontal and vertical tone arm pivot axis in a radial plane, disposed spaced apart from each other, to the vertical tone arm pivot axis. Two lightelectric transmitters are immovably disposed adjacent the vertical tone-arm pivot axis and at a close distance opposite the cross-sectional faces of the light guides. A third light guide is secured in the tone arm and is directed with one of its ends towards the light-beam control member and terminates with the cross-sectional face of the other of its ends close to the horizontal and vertical tone arm pivot axis in a radial plane to the vertical tone arm swinging axis. Also, a fourth light guide is directed with one of its ends towards said light source and terminates with the other of its ends at a slight distance opposite the cross-sectional face of the fourth light guide.

3,666,897

RECORDING AND REPRODUCING SYSTEM WITH VIDEO HEADS READING BOTH INFORMATION DATA FROM OBLIQUE TRACKS AND ADDRESS DATA FROM THE LONGITUDINAL CONTROL TRACK

Jerome D. Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,765
Int. Cl. G11b 5/52
U.S. Cl. 179—100.2 T **15 Claims**



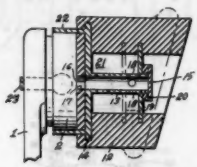
An elongated tape recording and reproducing system wherein a longitudinal control track is prerecorded on the edge of the tape either with a recording transducer, such as a magnetic head, as part of the system or off-line. After the control track is recorded, oblique video tracks are recorded on the tape with two video transducers or heads spaced 180° apart and traveling obliquely to the recorded control track. During reading of the video information, one obliquely traveling video head reads the address on the longitudinal recorded control track while the other obliquely traveling head reads the video information on the obliquely recorded video track. After the video heads have traveled 180°, their roles are reversed. That is, the video head which was reading the video information on the obliquely recorded track, now reads the address on the longitudinal recorded control track. In addition, the spacings between the address data on the control track serve as servo information for maintaining the tape and video heads in alignment.

3,666,898

QUIET LISTEN/TALK ADAPTORS FOR HANDSETS OR OTHER TYPICAL PHONES

Peter B. Ferrara, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 10, 1970, Ser. No. 96,797
Int. Cl. H04r 1/10
U.S. Cl. 179—180 **5 Claims**



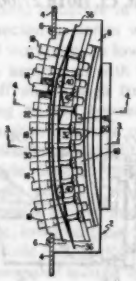
A sound attenuating adaptor for detachable connection to the receiver of a telephone handset consisting of a cap of resilient sound absorbing material which slips over the receiver of the handset. The cap is provided with a valve which, when the adaptor is pressed to a user's ear, deforms, causing the valve to open and permit the user to hear sound emitted from the receiver. The valve per se may be a slit in the outer end of the cap or a disc embedded therein, which slides on a tube when the cap is deformed to expose holes and allow escape of sound.

3,666,899

PUSH BUTTON SWITCHES WITH INTERLOCKING DIAPHRAGM CONTACT

Douglas A. Kerr, Alburquerque, N. Mex., assignor to Rolamite, Incorporated, San Francisco, Calif.

Filed Jan. 4, 1971, Ser. No. 103,422
Int. Cl. H01h 9/26, 1/48
U.S. Cl. 200—5 E **11 Claims**



A multiple push button assembly in which the buttons are arranged in a row. The buttons are normally biased outwardly relative to the panel in which they are supported, but when one of the buttons is pushed inwardly, it is latched and remains depressed until another button in the row is depressed. Movement of the other button releases the latch from engagement with the first button, allowing it to move outwardly to its initial position. Thus, only one button in the row remains depressed at a time. Latching of the buttons is accomplished by a thin, resiliently flexible band, which is mounted in longitudinal compression against a curved guide through which the buttons project. The band also serves as a contact element.

3,666,900

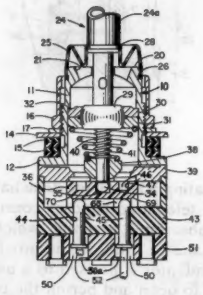
PUSH BUTTON SWITCH OPERATING MEANS WITH IMPROVED JOYSTICK AND CAM STRUCTURE

Richard C. Rothweiler, Asheville, N.C.; Carl B. Sohns, Whitefish Bay, and John A. Washburn, Milwaukee, both of Wis., assignors to Square D Company, Park Ridge, Ill.

Continuation of application Ser. No. 886,290, Dec. 18, 1969, now abandoned. This application Feb. 8, 1971, Ser. No. 113,645

Int. Cl. H01h *25/04*

U.S. Cl. 200—6 A 8 Claims



An operating arm pivotably movable selectively in opposite directions along two mutually-perpendicular paths of movement about an intermediate pivot point drives a sliding cam for operating linear reciprocative operators of a plurality of self-restoring switches by means of translating pins.

3,666,901

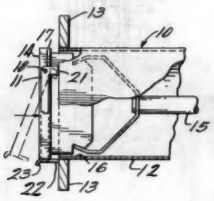
SWITCH ACTUATOR LOCK FOR PUSH BUTTON SWITCHES

Rudolf Weinhart, Inglewood, Calif., assignor to Master Specialties Company, Costa Mesa, Calif.

Filed Feb. 17, 1971, Ser. No. 116,084

Int. Cl. H01h *27/00*

U.S. Cl. 200—42 T 7 Claims



An improved lock for preventing accidental actuation of a push button switch. The switch includes an actuating button mounted to slide in a housing between a released position and an actuated position. A substantially U-shaped locking member is attached to the sides of the button to pivot between locked and released positions. When the locking member is in the locked position, tabs project towards the housing to prohibit movement of the button to the actuated position by abutting the housing. A lip projects from the locking member to facilitate pivoting of the locking member to the released position.

3,666,902

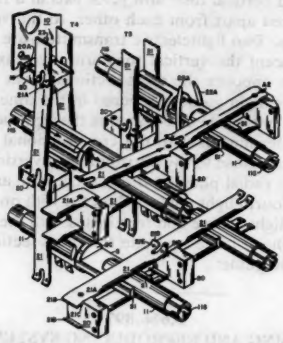
SWITCH SYSTEM

Kenneth Owen, Springfield, and Stephen W. Kershner, Falls Church, both of Va., assignors to Delta Electronics Inc., Alexandria, Va.

Filed Sept. 2, 1970, Ser. No. 68,971

Int. Cl. H01h *63/00*, *19/36*

U.S. Cl. 200—153 S 28 Claims



A switch system for connecting any one of a plurality of transmitters to any one of a plurality of antennas by providing a base structure on which identical module switch elements, made of conductive resilient cantilever line sections, are mounted on the front and back of a base to provide continuous vertical line conductor elements on the back connected to transmitter terminals and provide continuous horizontal line conductor sections on the front connected to antenna terminals, rotatably mounted rotors having flat conductive cam sections at right angles to each other engage the cantilevers and cross connect any one of the transmitter lines to any one of the crossing antenna lines. Each module includes a face plate carrying an insulator supporting a pair of resilient conductive cantilever line sections embracing the cam sections of the rotor to connect with similar resilient conductive cantilever sections for line continuing relation or for cross connection by the cooperating rotatably mounted rotors insulatingly supported.

3,666,903

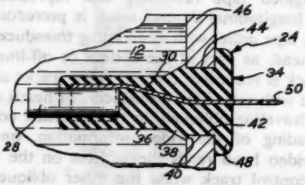
FLUID LEVEL DETECTOR

George Thomas Bata; Winford Boyd Carruth, and Thomas Francis Gosnell, all of Baltimore, Md., assignors to The Bendix Corporation

Filed Nov. 23, 1970, Ser. No. 91,695

Int. Cl. H01h *29/00*

U.S. Cl. 200—61.05 3 Claims



A fluid level detector for use in a master cylinder to determine if the brake fluid has dropped below a predetermined level. The fluid level detector is a three piece construction with a probe being made from a conductive, anti-corrosive substance, such as carbon, that is not subject to electrolysis formations. A retaining member formed from a non-conduc-

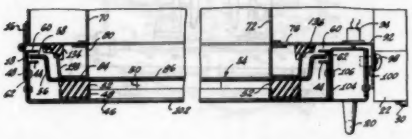
tive, rubber-like substance is inserted through a hole in the side of the master cylinder to secure the probe in a fixed position and, simultaneously, seals the hole in the side of the master cylinder. A conductive metal piece which extends into the retainer provides a connection to the probe from the outside of the master cylinder. As the fluid in the master cylinder drops below and out-of-contact with the probe, the resistance between the probe and the master cylinder housing will approach infinity. As the resistance approaches infinity a signal will be transmitted to an indicator to alert the operator of a low fluid level in the master cylinder.

3,666,904

MICROWAVE OVEN AND DOOR STRUCTURE FOR MINIMIZING LEAKAGE

Edward Z. Krajewski, Camarillo, Calif., assignor to Bowmar/Tic, Inc., Newbury Park, Calif.

Filed Apr. 12, 1971, Ser. No. 133,307
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **7 Claims**



An oven structure has a front flange plate on which is a raised member that frames the oven cavity, and which has an outermost surface parallel to the flange plate. A door hinged at one end to the oven structure carries a floating pan which, via biasing elements shown as compressed rubber strips, is normally biased against a stop when the door is opened. The outer face of the pan is coated with dielectric material. When the door is closed, the coated face of the pan is brought in face-to-face engagement with the outermost surface of the frame member. The inward travel of the door upon closure causes the rubber strips to be further compressed and the lip of the pan to move free of the stop. The pan is sufficiently thin to conform to the outermost surfaces of the frame member contacted thereby, thus permitting a capacitive seal to be formed which is effective to keep leakage around the door edges to less than a milliwatt of power. In addition, the portion of the frame adjacent the flange plate is surrounded by lossy gasket material in which is embedded ferrite or other suitable microwave energy absorbing material. A door closure mechanism is shown that employs a cam which operates in conjunction with the pan biasing elements to effect desired latching of the door.

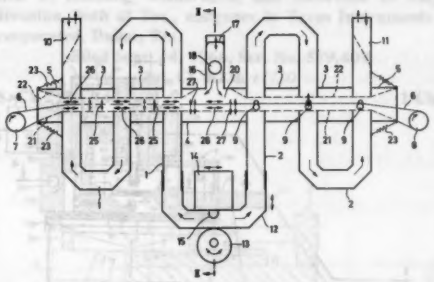
3,666,905

METHOD AND APPARATUS FOR DIELECTRIC HEATING

Paul C. Muller, Felsenau, Switzerland, and Karl H. Schneider, Opladen, Germany, assignors to Messrs. Paul Troester Maschinenbau, Hannover-Wulfel, Germany

Filed Apr. 24, 1970, Ser. No. 31,603
Claims priority, application Germany, Apr. 25, 1969, P 19 21 065.2
Int. Cl. H05b *5/00*
U.S. Cl. 219—10.55 **10 Claims**

A method and apparatus for heating plastics or rubber articles of complex shape in which the articles are moved on a conveyor belt through a hollow waveguide excited with a microwave energy flow or field acting in one direction. A sinuous hollow waveguide perpendicularly communicates and intersects with the first waveguide at a plurality of spaced apart intervals and is excited with the microwave energy flow acting in a direction perpendicular to the first direction. The articles are thus exposed alternately to staggered energy flows acting perpendicularly of one another,



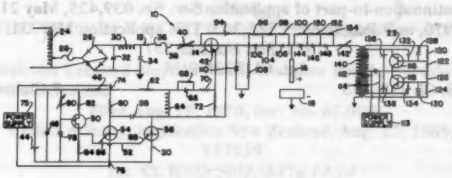
whereby to improve the efficiency of heating and avoid local hot spots.

3,666,906

CARBIDE DEPOSITION STRUCTURE AND METHOD

Thomas D. Byrne, 4455 Knapp Avenue, N.E., Grand Rapids, Mich.

Continuation-in-part of application Ser. No. 543,350, Apr. 18, 1966, now abandoned. This application June 4, 1969, Ser. No. 840,092
Int. Cl. B23k *9/04*
U.S. Cl. 219—76 **12 Claims**



The carbide deposition structure of the invention includes a power supply connected in series with a switch across a carbide electrode and workpiece, a low voltage, low frequency oscillator operably associated with the switch for turning the switch on and off and a high frequency, high voltage oscillator for initiating an arc between the electrode and workpiece while the switch is turned on, after which the arc is sustained by the power supply until the switch is turned off. The method of carbide deposition disclosed includes connecting a power supply across a workpiece and a carbide electrode through a switch, closing and opening the switch by means of a low voltage, low frequency signal and initiating an arc between the electrode and workpiece during the time the switch is closed by means of a high voltage, high frequency source of electrical energy and sustaining the arc between the electrode and workpiece until the switch is subsequently opened.

3,666,907

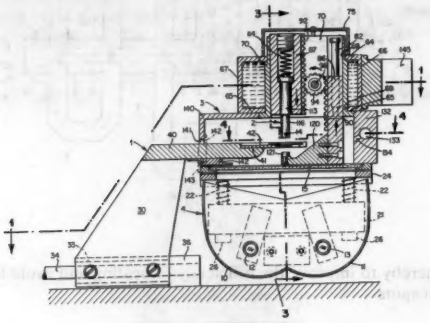
APPARATUS FOR ASSEMBLING FLAT PACKS

Reginald F. Nugent, Yardley, Pa., and George P. Snyder, Trenton, N.J., assignors to Time Research Laboratories, Inc., Pennington, N.J.

Filed Nov. 6, 1969, Ser. No. 874,506
Int. Cl. B23k *1/02*
U.S. Cl. 219—85 **8 Claims**

Apparatus for connecting the bases and lids of flat packs including a dry box, flat pack handling mechanism inside of the box, an infra-red heat source outside of the box with its

energy transmitted through the window means to flat packs secured by the handling mechanism inside the box, a shuttle to take the flat packs in and out of the box and means to



vibrate the handling mechanism so as to apply vibratory mechanical energy to the flat packs when exposed to infrared energy.

3,666,908

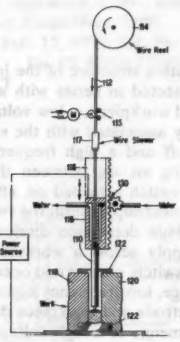
METHOD FOR VERTICAL WELDING OF ALUMINUM

Alfred Buxton Crichton, Montrose, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 039,425, May 21, 1970, now Patent No. 3,585,343. This application Mar. 31, 1971, Ser. No. 129,757

Int. Cl. B23k *9/18*

U.S. Cl. 219—73 **8 Claims**



A method for vertical welding of aluminum wherein a cavity is formed between aluminum plates by placing graphite retaining members on the outside surface thereof. At least one non-consumable guide tube is placed in the cavity and a consumable wire is passed therethrough. A halogen base flux is fed into the cavity to shield the weld puddle and to provide a medium for resistance melting. Voltage is supplied to the wire from about 40 volts and 1,300 amps to about 75 volts and 400 amps. When multiple guide tubes and wires are used, the wire is skewed prior to entry into the non-consumable guide tube and rotated as it emerges therethrough to ensure complete fusion.

3,666,909

ARRANGEMENT FOR MOUNTING, ADJUSTMENT AND MAINTENANCE OF A CYLINDER IN A HORIZONTAL POSITION FOR DEPOSITING A LAYER ON ITS SURFACE, USING THE ELECTROSLAG METHOD

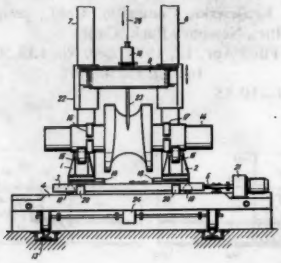
Zdenek Smitmajer; Pavel Blaskovits; Anton Krajmer, all of Bratislava, and Jiri Jebas, Chomutov, all of Czechoslovakia, assignors to Vyskumny ustav zvaracsky, odborove veduce pracovisko zvarandia, Bratislava, Czechoslovakia

Filed Mar. 10, 1970, Ser. No. 18,124

Claims priority, application Czechoslovakia, Mar. 13, 1969, 1804-69

Int. Cl. B23k *9/04*

U.S. Cl. 219—76 **2 Claims**



An arrangement for depositing a metallic layer on the surface of a cylindrical object, for instance of a grooved roll of a rolling machine or of similar objects, provided with stable supporting means of a turn-table with the welding on device, and with a platform with supporting posts for supporting the cylinder in the horizontal position, adjustable in direction of the longitudinal axis of the cylinder, with the possibility to withdraw the whole platform from the welding-on position below the welding-on device.

3,666,910

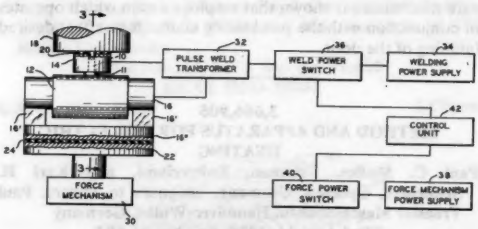
METHOD OF SOLID STATE BONDING AN ARTICLE TO A TUBE SURFACE

David G. Anderson, Bloomfield Hills, Mich., assignor to Quanta Welding Company, Troy, Mich.

Filed Feb. 3, 1971, Ser. No. 112,250

Int. Cl. B23k *11/04*

U.S. Cl. 219—107 **7 Claims**



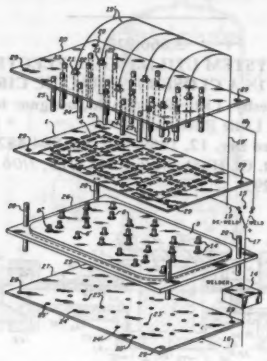
An article of manufacture consisting of a fastener bonded to an exposed surface of a tube by a solid state pulse resistance weld at the faying interface between the fastener and the tube to form an integral unitary structure. The method of producing the unitary structure involves the utilization of unique welding structures wherein the parts being integrated are disposed in juxtaposed position followed by a time phased application of a force pulse and an electrical energy pulse to the assembled parts to produce a solid state resistance weld at the faying interface to achieve the desired structure.

3,666,911

METHOD FOR MANUFACTURING PLANAR RAISED CATHODE GAS TUBES

James B. Armstrong, Phoenix, Ariz., assignor to Sperry Rand Corporation

Filed Jan. 23, 1970, Ser. No. 5,436
Int. Cl. B23k 9/00
U.S. Cl. 219—117 2 Claims



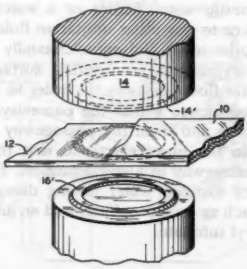
A method for fabricating segmented planar raised cathode elements in an alphanumeric display gas tube employing a weld and de-weld process.

3,666,912

METHOD OF SOLID STATE BONDING

David G. Anderson, and John C. Parker, both of Bloomfield Hills, Mich., assignors to Quanta Welding Company, Troy, Mich.

Filed Jan. 8, 1971, Ser. No. 104,903
Int. Cl. B23k 9/00
U.S. Cl. 219—117 9 Claims



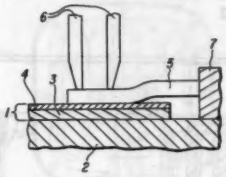
An article of manufacture comprised of at least two parts of electrically conductive metal joined together in overlapped relation by a solid state resistance bond at the faying interface wherein the bond area is very precisely defined by the physical shape of the attendant electrodes. The method of bonding the parts includes the utilization of a time phase application of a force pulse and an electrical energy pulse to the assembly of the part to achieve the desired solid state pulse resistance bond.

3,666,913

METHOD OF BONDING A COMPONENT LEAD TO A COPPER ETCHED CIRCUIT BOARD LEAD

James F. Haefling, Richardson, and Lawrence L. Meyer, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 14, 1966, Ser. No. 579,409
Int. Cl. B23k 11/20
U.S. Cl. 219—118 1 Claim



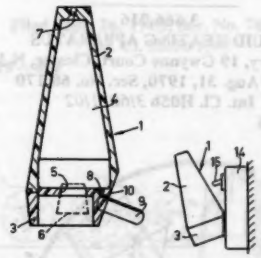
This invention provides a method for bonding a copper etched circuit board lead to a component lead while eliminating blow out of the copper lead by applying an oxide to the copper lead which is relatively non-conductive at temperatures below the welding temperature but decomposible at the welding temperature. Because of the insulating properties of the oxide, a larger current passes through the component lead than the copper lead, allowing the component lead to be preheated to the bonding temperature, decomposing the oxide and thereby bonding the copper lead to the preheated component lead.

3,666,914

ELECTRICALLY HEATED DISPENSER FOR GRANULAR SUBSTANCES

Malcolm Leonard Stephen Dean, Omapere Beach, Northland, New Zealand

Filed Aug. 19, 1970, Ser. No. 65,009
Claims priority, application New Zealand, Aug. 22, 1969, 157559
Int. Cl. H05b 3/02; A47g 19/24
U.S. Cl. 219—214 7 Claims



Dispensers for granular materials such as salt, pepper and other spices and including a container capable of enclosing the said materials therein and at least one dispensing orifice situated in the container and providing for restrained egress of said materials from the interior of the container to the exterior thereof. There is also included an electric heating means which may be wholly or partially embedded in part of the container and positioned in relation to the interior of the container such that heat when generated by said means can pass to said interior and heat granular materials when contained in the container to evaporate any moisture contained therein such that the evaporated moisture leaves the interior of the container by of the orifice. Electrical contact pins are connected to and lead from the heating means and these pins protrude generally perpendicular to a downwardly and in-

wardly inclined exterior surface of the container and are adapted to be engageable with an electric socket whereby said electric heating means can be electrically connected to a source of electric supply.

3,666,915

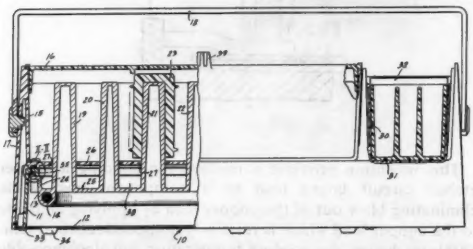
STEAM OR DRY HAIR CURLER HEATING APPARATUS

Robert A. De Napoli, Chicago, Ill., assignor to Northern Electric Company, Chicago, Ill.

Filed July 13, 1970, Ser. No. 54,160

Int. Cl. A45d *4/12;* **H05b** *3/02*

U.S. Cl. 219—222 **12 Claims**



A hair curler heating apparatus providing combined heating effects so that hair curlers can be, in accordance with the preference of the user, selectively heated solely by dry heat from within or can be heated from within by dry heat and simultaneously heated from the outside by means of heated water vapor or steam to provide damp curler. The apparatus includes an electrically heated metallic base having a peripheral lip surrounding a flat, upwardly directed, water receiving, retaining and evaporating area to which a plurality of curler supporting mandrels are secured. A non-metallic chassis and housing structure to which the peripheral lip is attached in water-tight relationship supports the metallic base. A removable cover overlies the upwardly directed area and normally encloses the mandrels and any curlers thereon for retaining heated air and/or water vapor thereabout so that the curlers can be selectively heated with or without the presence of heated water vapor. A measuring cup sized to introduce an appropriate quantity of water to the upwardly directed area is provided.

3,666,916

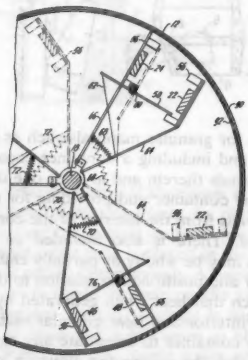
FLUID HEATING APPARATUS

Henry W. Angelery, 19 Gwynne Court, Closter, N.J.

Filed Aug. 31, 1970, Ser. No. 68,170

Int. Cl. H05b *3/60, 1/02*

U.S. Cl. 219—286 **17 Claims**



A fluid is heated as it passes through the tank of an apparatus in which one or more pairs of electrodes are provided. The fluid is heated by a current which flows between the electrodes. At least one electrode of each pair is movable so that the distance between the electrodes can be varied to modulate the current flow in accordance with the quantity of heat to be added to the fluid. Further modulation of the current can be accomplished by placing an electrically insulating shutter between the electrodes. This shutter moves in conjunction with a movable electrode to vary the extent to which it blocks the most direct current path. The electrical power used by the apparatus can be limited to prevent high peak power demands.

3,666,917

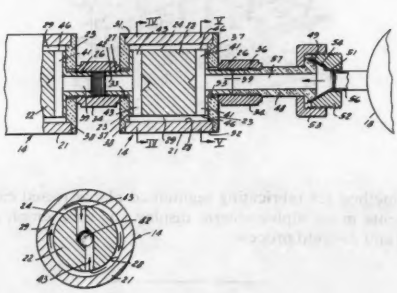
HEATING SYSTEM UTILIZING AN ELECTROLYTIC DEVICE IN A CLOSED HYDRAULIC CIRCUIT

William T. Oglesby, Little Rock, Ark., assignor to Hydroflow Corporation, Little Rock, Ark.

Filed Dec. 12, 1969, Ser. No. 884,482

Int. Cl. H05b *3/60;* **F24h** *1/12, 3/06*

U.S. Cl. 219—292 **5 Claims**



An electrolytic method and means of heating is characterized by driving an electrolytic fluid of predetermined physical characteristics through a closed hydraulic circuit including, in series arrangement, a pump for driving the fluid through the circuit, an electric heating device of the type including at least one pair of electrodes arranged to define a flow passageway within the circuit and means for applying an electric potential across the fluid to heat the fluid electrolytically and heat exchanger means configured for transferring thermal energy either to a gas, such as air in a manner to form a space heater, or to a liquid, such as water in a manner to form a domestic water heater or a water heater for a swimming pool or to any other utilitarian fluid. Each pair of electrodes includes inner and outer coaxially disposed electrodes having cylindrical confronting surfaces spaced to define an annular flow passaway. In order to eliminate eddy currents and turbulence within the passaway, the inlet and outlet conducts to and from the passageway are so formed and arranged in the inner electrode that the fluid passes through the passageway in a spiral fashion. The electrolytic fluid consists of distilled water having dissolved therein a metallic salt, such as copper sulfate, and an anionic material, such as alkyl aryl sufonate.

3,666,918

ELECTRIC POWERED WATER HEATING SYSTEM

John A. Clark, Jr., East Stroudsburg; Lemuel J. Morgan, Stroudsburg, both of Pa., and Robert F. Kirschner, Stoughton, Mass., assignors to The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.

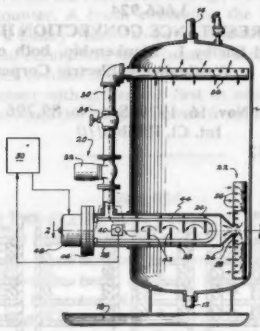
Continuation-in-part of application Ser. No. 28,355, Apr. 13, 1970. This application Mar. 11, 1971, Ser. No. 123,198

Int. Cl. F24h *1/20*

U.S. Cl. 219—314 **36 Claims**

A water heating system including a tank for storing heated water for withdrawal to a point of use and having a cold

water inlet for replenishing withdrawn water; a conduit having an immersion heater therewithin, the conduit having a water intake manifold for delivering water from the tank to pass in heat exchange relation with the immersion heater and having a heated water outlet arranged in flow communication with the point of use, the manifold having openings arranged in flow communication with different levels within the tank



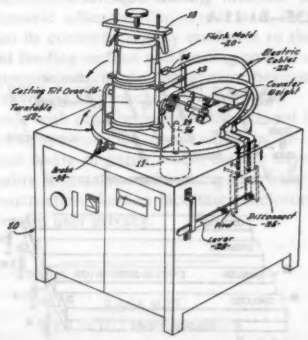
at which levels different water temperatures may exist, whereby the temperature of water passing into heat exchange relationship with the heater is an integral of the temperatures of water from the different levels; and a temperature sensor for controlling the rate of heat input to water passing through the conduit as a function of the integral temperature.

3,666,919

CASTING OVEN

Frank M. Thiel, 8828 National Boulevard, Culver City, Calif.

Filed June 14, 1971, Ser. No. 152,519
Int. Cl. F27b *14/00*
U.S. Cl. 219—421 **5 Claims**



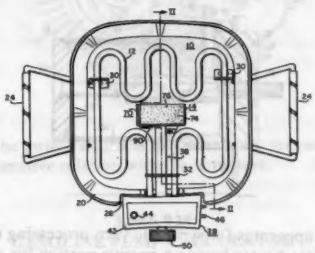
The invention is concerned with an electrically energized casting oven of the crucible type, and one which may be used, for example, for melting precious metals at elevated temperatures of the order of 2,400° F. The oven of the invention includes a coil of resistance steel, or other appropriate resistance material, rather than carbon electrodes, as the heating element.

3,666,920

BASE CONTAINING AN ELECTRIC HEATER ELEMENT AND AN AUTOMATIC TEMPERATURE CONTROL FOR SUPPORTING GLASS OR CERAMIC COOKWARE

David B. Price, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1971, Ser. No. 109,829
Int. Cl. H05b *3/68*
U.S. Cl. 219—449 **11 Claims**



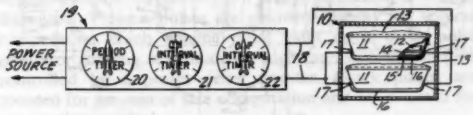
A base containing an electric heater element and controls for supporting glass or ceramic cookware and providing automatic temperature control. The control includes a bi-metal controlled switch enclosed in a metal housing having one surface, generally adjacent the bottom of the cookware, treated so as to be highly absorptive of infrared radiation incident thereon. The bi-metal then reacts in response to the amount of radiation absorbed on that surface which is directly related to the temperature of the cookware. Other surfaces of the housing are also similarly treated to aid dissipation of the heat in the control and minimize lag time between the temperature of the dish and the temperature of the controls.

3,666,921

APPARATUS AND METHOD FOR PULSE COOKING AND HEATING

Thomas S. Shevlin, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sept. 26, 1968, Ser. No. 762,913
Int. Cl. H05b *1/02*
U.S. Cl. 219—492 **17 Claims**

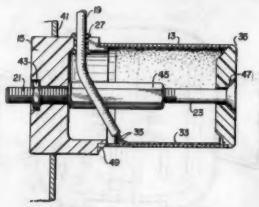


This invention is directed to a low thermal inertia heating system for pulse heating a preselected quantity of food or other materials. Pulsations of heat are produced and controlled by timing means so that a predetermined amount of heat can be generated in a predetermined heating period. Each pulsation of heat is followed by a predetermined time interval during which no power is applied allowing the heat to be absorbed or diffused in the food or material. The pulse intervals are controlled by the timing means so that the amount of heat required to cook or heat the food or material can be precisely metered and/or programmed.

3,666,922
THERMAL CONTROLLED DISPOSABLE UNIT HEATING APPARATUS

Frank W. Leitner, and Clayton O. Miller, both of Charlotte, N.C., assignors to Coltron Industries, Inc., Charlotte, N.C.

Filed Nov. 18, 1969, Ser. No. 877,654
Int. Cl. B21b *27/04*
U.S. Cl. 219—469 **17 Claims**

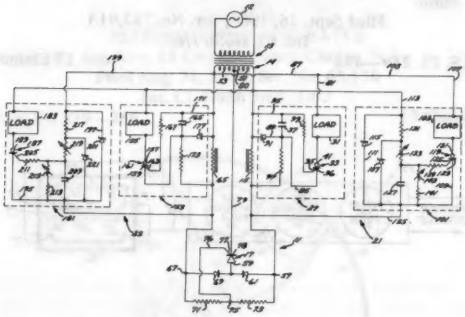


Heating apparatus for synthetic yarn processing comprising a pin or plate heater having a passive portion for attachment to a machine to provide and maintain predetermined alignment for a load contacting element of a removable and replaceable active portion. The thin load contacting element carries a thin etched foil heater and intimate resistance sensor bonded to its inner surface and is equipped with electrical leads to comprise the disposable active portion. The passive portion further thermally isolates the active portion to ensure high efficiency in transferring heat to the yarn load. Fast response inexpensive metals serve as the load contacting element so the compact low mass foil heater requires less power, responds quicker, and weighs and costs less than conventional yarn heaters.

3,666,923
CONTROL APPARATUS HAVING FULL CURRENT PULSE LOAD CONDUCTION

William W. Chambers, Anaheim, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 8, 1970, Ser. No. 44,381
Int. Cl. H05b *1/02*
U.S. Cl. 219—499 **10 Claims**

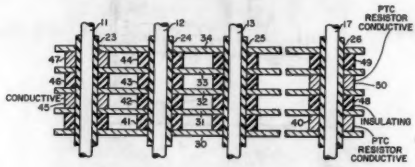


Control apparatus for connection with a pulsating current source and to control current flow to a load. The control apparatus consists of a sensing circuit including a first gate operated switch means for controlling current flow through resistance means in the bridge to create a voltage drop thereacross. A control circuit is included which has a controlled switch means for controlling the current to the controlled load. The controlled switch means includes a gate responsive to a predetermined current level to render such control switch means conductive to complete the circuit through the load. Current storage means is connected across the resistance means and with the gate of the controlled switch for storage of current during current pulses in the bridge circuit for subsequent delivery to the controlled switch gate to trigger such controlled switch during subsequent pulses. Consequently, the controlled switch means will be rendered conductive early in each pulse of current to conduct substantially full current pulses to the load.

3,666,924
ELECTRIC RESISTANCE CONVECTION HEATER

Erik Jensen, and Shelby L. Blankenship, both of Staunton, Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 16, 1970, Ser. No. 89,796
Int. Cl. H05b *3/10*
U.S. Cl. 219—552 **4 Claims**

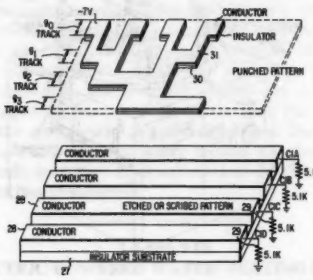


An electric resistance convection heater comprising a stack of electrically conductive fin electrodes mounted in spaced relation on a plurality of electrically insulating support elements with spacer washers therebetween, certain of said spacers being formed of insulating material and others being formed of conductive material to cause an electric current applied to different ones of said electrodes to flow serially through the electrodes in a predetermined path, and certain of said conductive spacers being formed of a material having a positive temperature resistance coefficient thus providing self-limiting response for the heater.

3,666,925
CODED TAPE AND OPEN CONTACT SENSING CIRCUIT

Ira R. Marcus, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed May 21, 1970, Ser. No. 39,402
Int. Cl. G06r *7/06*
U.S. Cl. 235—61.11 A **5 Claims**



A coded tape used to preset a binary counter to any desired predetermined count is composed of two principal parts. The first part comprises an insulating layer or substrate and a conducting layer. The conducting layer is etched or scribed to divide it into a plurality of bit tracks. The second part also comprises two layers and may comprise an insulating layer and a conducting layer which are punched out in the form of the Gray Code pattern. This part is laminated to

the first part to form a unitary structure. Alternatively, a conductive layer is bonded to the first part by an adhesive which acts as an insulating layer. The second conductive layer and adhesive are selectively etched to form the Gray Code pattern. One of the conducting layers is biased through a resistance to ground while the other is biased to a different potential. The binary counter is preset by positioning the tape with respect to a read head having a brush for each of the plurality of bit tracks. The code at that point on the tape is transferred from the read head through a code converter to the binary counter. A brush contacting the first conductive layer causes a binary "zero" to be read, and a brush contacting the second conductive layer causes a binary "one" to be read. The open contact sensing circuit senses when any brush is not in contact with either the first or second conductive layers and prevents the binary counter from being preset.

3,666,926

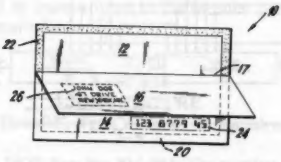
CARRIER ENVELOPE FOR MACHINE PROCESSING AND PROCESS FOR MAKING SAME

Alfred G. Conte, Jr., Princeton Junction, and Jeffrey Stanford Reinert, Haworth, both of N.J., assignors to Praxedes Systems, Inc., Princeton, N.J.

Filed Dec. 23, 1970, Ser. No. 101,000

Int. Cl. G06r *19/00;* **B65d** *27/14*

U.S. Cl. 235—61.12 R **4 Claims**



A carrier envelope adapted for processing by automatic data equipment employs first and second rectangular surfaces secured along each edge parallel to the direction of document translation through reading machine equipment with an elastomeric adhesive. The carrier and, for some applications, also its contents, readily conforms to the contour of a document feeding surface and feeding path in automatic reading equipment to facilitate engagement between printed fields on the envelope and machine reading head.

In accordance with other aspects of the present invention, the carrier envelope may be constructed in an improved manner without waste of paper stock; carrier envelopes are readily amenable to machine addressing and bulk handling; and a flap construction thereon facilitates enclosure insertation, and maintains user privacy.

3,666,927

READOUT APPARATUS

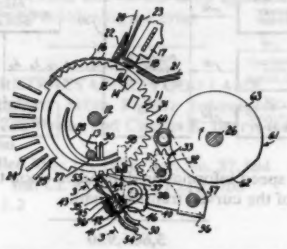
William A. Berry, Covina, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed June 24, 1971, Ser. No. 156,317

Int. Cl. G06c *29/00*

U.S. Cl. 235—61 PC **5 Claims**

A pulse type readout apparatus for data registering machines, such as mechanical adding and calculating machines in which data is transferred from the machine to a suitable remotely controlled device in parallel fashion by pulse signals. Such signals are formed by switch contacts which are momentarily closed by gear teeth carried by denominationally arranged differential actuators of the machine. The switch contacts are selectively moved into and out of cooperative relation with the actuators.



3,666,928

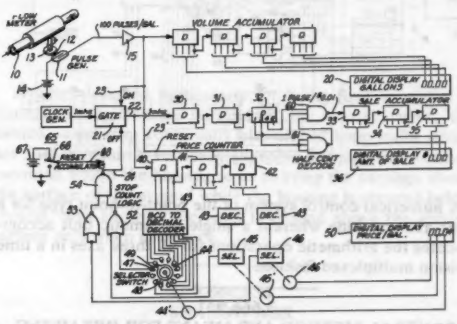
GASOLINE PUMP CALCULATOR

William F. Burke, Westminster; Daniel A. Gihring, Orange, and Thomas E. Jones, Costa Mesa, all of Calif., assignors to Pan-Nova, Inc., Santa Fe Springs, Calif.

Filed Apr. 30, 1971, Ser. No. 138,912

Int. Cl. B67d *5/22*

U.S. Cl. 235—92 FL **9 Claims**



A calculator for use in a gasoline dispenser or the like for calculating amount of sale and volume dispensed, and for displaying the amount and volume of sale and the price per gallon. A pulse generator actuated by the flow meter provides volume pulses at a relatively low rate as a function of volume dispensed. Volume pulses are counted directly for volume computation. Each volume pulse gates on a clock pulse generator running at a relatively high rate, with the on time controlled by a preset price counter. Clock pulses are counted for amount of sale computation and are counted for gate on time control.

3,666,929

FLIGHT CONTROL SYSTEM FOR FOLLOWING MULTI-STAGE DESCENT PROFILE

Bruce E. Menn, Woodland Hills, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

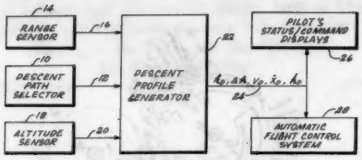
Filed Sept. 2, 1969, Ser. No. 854,376

Int. Cl. G06f *15/50*

U.S. Cl. 235—150.22 **25 Claims**

A flight control system for commanding an aircraft to fly a smoothly curved descent path during transition from a first linear descent path to a second linear descent path. The control system produces desired altitude information to define

an approximation to the curved descent path. The aircraft's horizontal axis is controlled during transition using desired



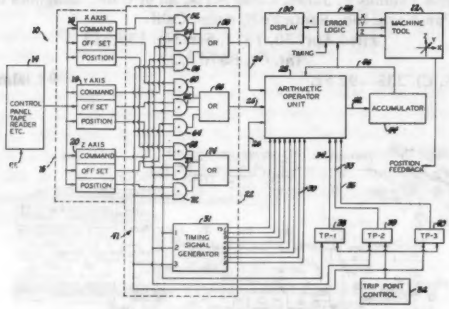
horizontal speed information dependent upon the instantaneous slope of the curved transition path.

3,666,930

TIME SHARED POSITIONING SYSTEM FOR NUMERICAL CONTROL

George H. McDaniel, Northville, Mich., assignor to The Bendix Corporation

Filed Aug. 5, 1970, Ser. No. 62,230
Int. Cl. G05b *19/22*
U.S. Cl. 235—151.11 **8 Claims**



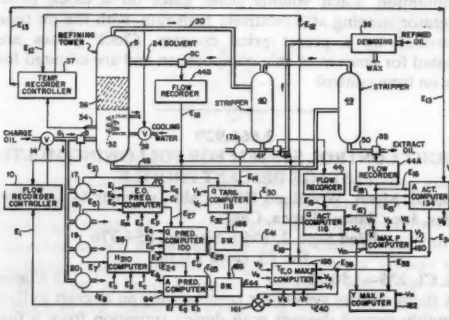
A numerical control system of the point-to-point type for a three-axis machine wherein a single arithmetic unit accommodates the arithmetic operations for all three axes in a time division multiplexed fashion.

3,666,931

CONTROL METHOD AND MEANS FOR OBTAINING OPTIMUM YIELDS OF REFINED OIL AND EXTRACT OIL FROM CHARGE OIL

Robert Alan Woodle, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 8, 1970, Ser. No. 96,193
Int. Cl. C10g *21/00*; G05b *15/02*
U.S. Cl. 235—151.12 **14 Claims**



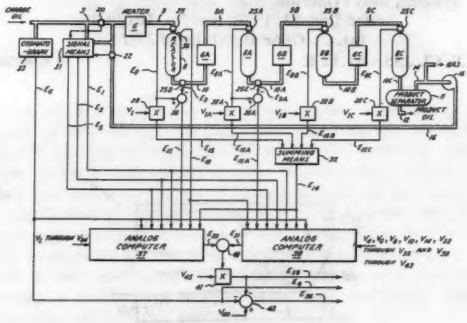
A system and method for controlling the solvent refining of a charge oil to obtain refined waxy oil of a specific quality which is subsequently dewaxed to provide refined oil. During a predetermined time period, the characteristics of the charge oil are sensed and corresponding signals provided. After the predetermined time period, characteristics of the charge oil, the refined waxy oil, extract oil and solvent are sensed and corresponding signals provided. Analog computers provide signals in accordance with equations, hereinafter disclosed, for controlling the charge oil flow rate and the temperature of the extract-mix in accordance with the condition signals and other signals corresponding to the current economic values of the charge oil, the refined oil and the extract oil.

3,666,932

MEANS AND METHOD FOR ON-LINE DETERMINATION OF THE AROMATIC, NAPHTHENE AND PARAFFIN CONTENTS OF CHARGE OIL

William D. White, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 30, 1970, Ser. No. 102,732
Int. Cl. C10g *35/04*; G06g *7/58*
U.S. Cl. 235—151.12 **12 Claims**



Outputs corresponding to the naphthene and the paraffin volume percent contents of charge oil being reformed by a catalytic reforming unit, along with an output corresponding to the aromatic volume percent content, are provided during the reforming operation in accordance with the following equations:

(1) $$\{\Delta T_1+2.94(H-8)+0.104662(P-550)+0.141123(M-117.5)+0.002308(T-930)^2+0.036641(H-8)(T-930)\}-\{85.83793+0.5510265(T-930)+8.664779(RSV-0.476)+0.0115268(P-550)(H-8)+0.000602621(P-550)(T-930)+2.529762(RSV-0.476)(H-8)+0.1537442(H-8)^2\}$$
$$XN_1=\frac{}{0.5470904+0.008687601(T-930)-0.0016322(P-550)}+62.5-2FA,$$

(2) $$\{\Delta T_2+0.07751601(P-550)+1.85(H-8)+0.383795(M-117.5)+13.4276(RSV-0.476)+0.005342901(T-930)^2+0.061907(T-930)+0.278497(RSV-0.476)(T-930)+0.005999501(T-930)(M-117.5)\}$$
$$-\{44.29602+0.0009998862(P-550)(T-930)+0.2464407(H-8)^2\}$$
$$XN_2=\frac{}{0.8316077+0.008959372(T-930)-0.0024203(P-550)}+62.5-2FA,$$

(3) Naphthene content $=0.5(XN_1+XN_2)$

and

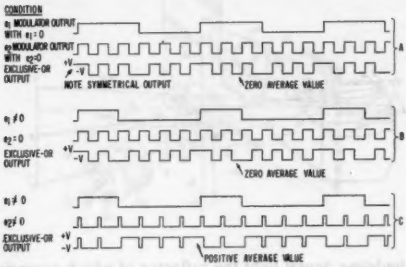
(4) Paraffin content $=100-FA-$ naphthene content

Where ΔT_1 and ΔT_2 are the temperature drops across the first and second reactors, FA is the aromatic content of the charge oil in percent volume, M is the average molecular weight of the charge oil, T is the weighted average reactor inlet temperature in °F, P is the inlet pressure of the first reactor in psig, H is the hydrogen to hydrocarbon mole ratio and RSV is the reciprocal liquid hourly space velocity. Signals are provided, corresponding to different sensed operating conditions and properties of the charge oil during the reforming operation, to analog computers. The analog computers provide signals in accordance with Equations 1 and 2 which are used to develop outputs corresponding to the aromatic, naphthene and paraffin contents of the charge oil.

3,666,933
FOUR QUADRANT MULTIPLIER USING PULSE WIDTH MODULATORS AND THE DIGITAL EXCLUSIVE-OR

Paul H. Grobert, Nutley, N.J., assignor to Communications & Systems, Inc.

Filed July 23, 1970, Ser. No. 57,478
Int. Cl. G06g *7/16*
U.S. Cl. 235—194 **2 Claims**

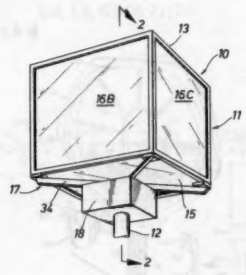


There is disclosed a four quadrant multiplier circuit and method in which the signals to be multiplied are used to pulse width modulate carrier signals of different frequencies, respectively, and the resulting pulse width modulated signals are applied to an exclusive — OR circuit. The output of the exclusive — OR circuit is filtered to remove the carrier signals and any beat frequency between the carriers so that the output will be proportional to the bi-polar product of the signals being multiplied.

3,666,934
LIGHT FIXTURE

Buell Moore, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed Apr. 10, 1969, Ser. No. 815,003. The portion of the term of the patent subsequent to Oct. 5, 1988, has been disclaimed.
Int. Cl. F21v *19/00*
U.S. Cl. 240—3 **5 Claims**

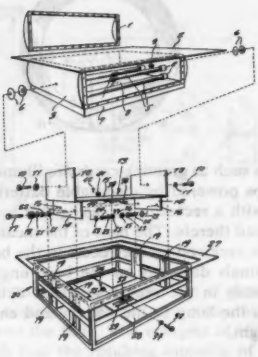


A light fixture comprising a housing having an opening intermediate oppositely facing walls to permit a lamp to be moved into and out of the interior of the housing. A closure is removably disposable across the opening to enclose the housing in weather-tight fashion. A sleeve on one of the oppositely facing walls of the housing receives an electrical socket for axial movement between retracted and extended positions. A means on the other of the oppositely facing walls provides a face of heat insulating and cushioning material for engaging the non-electrical end of the lamp when the electrical end thereof is received within the socket. The face and sleeve are spaced apart a distance which permits the electrical end of the lamp to be moved into and out of the socket when the socket is retracted. A means is provided for positioning the socket in its extended position so as to hold the opposite, non-electrical end of the lamp against the face of heat insulating and cushioning material.

3,666,935
RETRACTABLE FLOOD LAMP

Oscar G. Pritchett, 318th Fighter Interceptor Squadron, McChord AFB, Wash., and Charles E. Derry, Route #3, St. Maries, Idaho

Filed May 15, 1970, Ser. No. 37,584
Int. Cl. F21S *3/00;* **F21P** *5/00*
U.S. Cl. 240—1.2 **2 Claims**

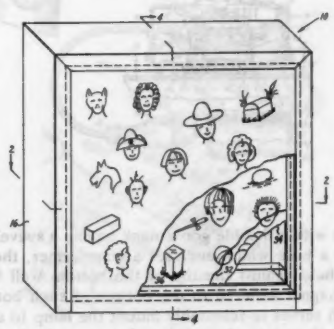


A lamp designed particularly for being flush mounted in numerous applications particularly at aircraft fields, the device comprising continually plurality of lamp bulbs which are footed within a vertically slideable carriage that is track mounted within the housing so as to bring the carriage above the surface of the ground while the housing is secured below ground, thus allowing the lamp to extend above the ground surface only when necessary.

3,666,936
SHADOW BOX

Ranson W. Webster, Jr., 8606 Cliffwood Way, and Ernst H. Jarke, III, 8467 Everglade Dr., both of Sacramento, Calif.

Filed June 30, 1970, Ser. No. 51,201
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 **1 Claim**



An enclosure having a translucent screen at the front thereof, a plastic screen having a pattern thereon parallel to and spaced from the translucent screen, and colored light

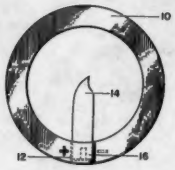
bulbs arranged on the inside surface of the rear of the enclosure for blinking various colored patterns onto the translucent screen.

3,666,937

APPARATUS FOR ILLUMINATING ORNAMENTS

Charles Franc, Lenox Hill Station 221 East 70th Street, New York, N.Y.

Filed Nov. 7, 1969, Ser. No. 874,855
Int. Cl. F21v *33/00*; G09f *13/00*
U.S. Cl. 240—6.4 **6 Claims**



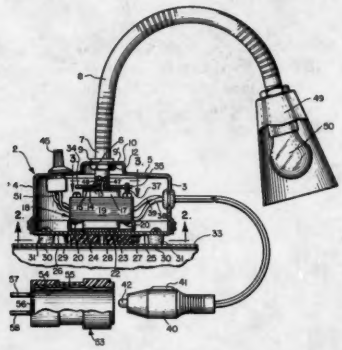
Ornaments such as greeting cards are illuminated by incandescent lamps powered by disposable batteries. The battery is provided with a recess in its casing and has its output terminals disposed therein. The base of the incandescent lamp is adapted to be received by the recess in the battery and lamp contact terminals disposed on the base engage the battery output terminals in the recess and thus detachably electrically connect the lamp to the battery and energize the lamp to produce light.

3,666,938

LAMP STRUCTURE

Frank J. Dolega, 31 Weems Street, Boca Chica R. Branch, Brownsville, Tex.

Filed Feb. 17, 1971, Ser. No. 116,086
Int. Cl. F21v *21/06*; F21s *1/12*; F21l *15/16*
U.S. Cl. 240—52.15 **10 Claims**



A lamp with a flexible goose neck having a swivel connection with a base which encloses a transformer, the core of which is held against the top of the bottom wall by a permanent magnet adhered to the bottom of such bottom wall and which serves to releasably mount the lamp to a metallic support such as a mechanic's bench or a car body. The magnet flux saturates the magnetic core which magnetically holds the swivel connection in any of a plurality of adjusted positions without fatiguing the flexible goose neck which in present construction eventually breaks off.

3,666,939

SHADELESS DENTAL LIGHT

Sadayasu Ota, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Mar. 19, 1971, Ser. No. 126,010
Claims priority, application Japan, Mar. 23, 1970, 45/27594
Int. Cl. A61b *1/06*
U.S. Cl. 240—41.15 **2 Claims**

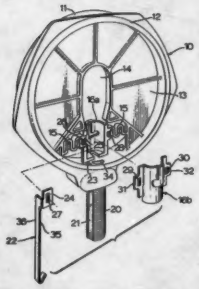
A shadeless dental light the reflector of which comprises a plurality of section mirrors arranged side by side along an elliptical arc. Each of the component section mirrors has a reflecting surface which is plain in transverse section and has a central portion of the length thereof fromed into a circular arc and portions extending from the opposite ends of the length of the central portion formed into a circular arc having a different radius of curvature than that of the central portion.

3,666,940

SHOCK RESISTANT MOUNTINGS FOR LIGHT BULBS

Hugo Magi, Etobicoke, Ontario, Canada, assignor to Dominion Auto Accesories Limited, Toronto, Ontario, Canada

Continuation-in-part of application Ser. No. 809,315, Mar. 21, 1969, now Patent No. 3,564,483. This application Apr. 27, 1970, Ser. No. 32,084
Int. Cl. F21v *15/04*; H01j *5/48*
U.S. Cl. 240—90 **9 Claims**



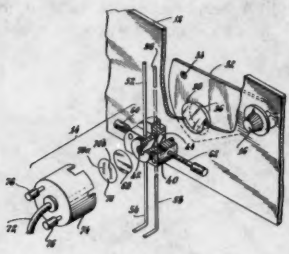
A lamp includes a housing and a socket adapted to receive a light bulb, the latter being suspended from the housing by shock resistant mounting means comprising arms each having rigid points of connection formed integral with the housing and the socket, the arms being integral with the housing and the socket and extending therebetween with the arms each being fabricated of a strip of material formed into a corrugated and having a plurality of corrugations.

3,666,941

DIFFERENTIAL FILTER FLUORIMETER

Emmett S. Watson, Jupiter, Fla., assignor to Laboratory Data Control, Inc., Danbury, Conn.

Filed Sept. 28, 1970, Ser. No. 76,073
Int. Cl. G01n 23/22
U.S. Cl. 250—43.5 R 9 Claims



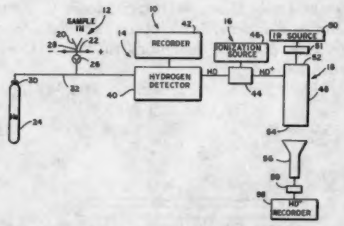
There is disclosed a double beam differential fluorimeter requiring no light chopper and characterized by unusually small cell volume and high optical efficiency. The instrument comprises a bifurcated conical light tunnel having highly reflecting internal surfaces. A transparent tube passes through each side of the bifurcated light tunnel, one for containing a sample fluid, the other for containing a reference fluid. A light source directs ultraviolet radiation into the large end of the conical tunnel. A pair of photodetectors are positioned at the small end of the tunnel, together with an ultraviolet blocking filter. Each detector is responsive, respectively, to fluorescence from the sample and reference fluids. An electrical bridge circuit compares the intensities of the fluorescence derived from the sample and reference fluids.

3,666,942

ANALYSIS OF HYDROGEN-DEUTERIUM MIXTURES

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Harry C. Lord, III, 3740 Hampton Road, Pasadena, Calif.

Filed Nov. 6, 1970, Ser. No. 87,550
Int. Cl. G01n 21/34
U.S. Cl. 250—43.5 R 11 Claims



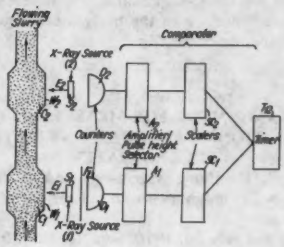
A hydrogen-deuterium mixture is partially separated by helium carrier gas chromatography to form an effluent which is measured to determine total hydrogen isotopic concentration. The HD component of the effluent is ionized to form HD^+ ions. The HD^+ 1-0 band absorption is then measured with a conventional high resolution infrared detector providing a signal indicative of absolute deuterium concentration (as HD). The H/D ratio is readily determined from the total concentration and deuterium concentration.

3,666,943

METHOD OF AND APPARATUS FOR DETERMINING THE MEAN SIZE OF GIVEN PARTICLES IN A FLUID

Kenneth Garfield Carr-Brion, and Doris Audrey Jenkinson, both of Stevenage, Hertfordshire, England, assignors to National Research Development Corporation, London, England

Filed Sept. 3, 1968, Ser. No. 756,767
Claims priority, application Great Britain, Sept. 20, 1967, 42,875/67. The portion of the term of the patent subsequent to Sept. 15, 1987, has been disclaimed.
Int. Cl. G01n 23/22
U.S. Cl. 250—51.5 7 Claims



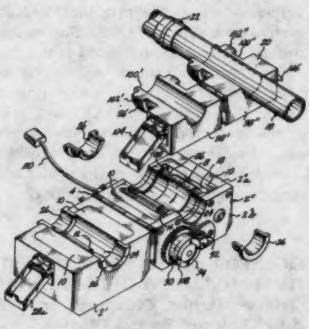
A method of determining the mean size of given solid particles in a fluid comprises passing two x-ray beams of different energies into the fluid. The energies of the two X-ray beams being such that the resulting intensity of fluorescent radiations emitted from the particles due to one beam is substantially independent of the mean size of the particles while the intensity of fluorescent radiations emitted from the particles due to the other beam is substantially dependent upon the mean size of the particles. A comparison of the intensities of these two types of emitted fluorescent radiations gives an indication of the mean particle size.

3,666,944

MEANS AND TECHNIQUE FOR MAKING RADIOGRAPHIC EXAMINATIONS

Charles P. Baldinger, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 11, 1970, Ser. No. 36,164
Int. Cl. G03b 41/16
U.S. Cl. 250—65 R 6 Claims



A means and technique are disclosed for making a radiographic examination of a body at any or all points about the periphery thereof. According to the technique, a nuclear

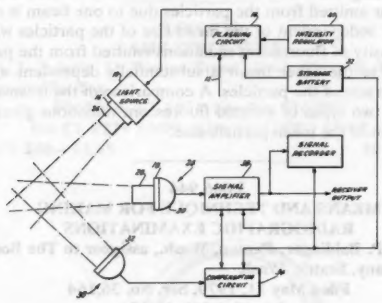
radiation source is enclosed in a recording device which is adapted to shield the source against the escape of radiation therefrom, but which has a recess in the exterior thereof across which the radiation can travel in a path confined within the device. The body is inserted into the recess so that a portion of the same is exposed to the radiation thereacross, while a section of a recording film which is sensitive to the radiation is arranged in the recess on the opposite side of the body from the source to record the character of the portion thereon. Thereafter, the body, the source, and the film are shifted in relation to one another so as to expose a different portion of the body to the path of radiation while another section of the film is arranged in the recess on the opposite side of the body from the source. Moreover, during the shifting process, radiation shielding is interposed in the path of radiation between the source and the recess so that the character of each portion of the body is separately recorded on a different section of the film.

3,666,945

ARRANGEMENT FOR MEASURING THE CONCENTRATION OF FLUORESCENT MATERIALS IN AIR AND WATER

Frank Frungel, Hamburg, Germany, and Peter Krawarik, Princeton, N.J., assignors to Impulsphysik GmbH, Hamburg, Germany

Filed July 30, 1970, Ser. No. 59,630
Claims priority, application Germany, Aug. 2, 1969, P 19 39 524.5
Int. Cl. G01n *21/22*
U.S. Cl. 250—71 R **18 Claims**



An arrangement through which the concentration of fluorescent materials, when present in low quantities, may be measured within a fluid. A transmitter is flashed periodically at a rate corresponding to the rate that measurements are taken, for the purpose of exciting the fluorescent materials. Filters and optical systems are provided at the transmitter for transmitting the appropriate light. A receiver spaced from the transmitter or light source is also equipped with appropriate filters and optical systems, and receives on a photosensor, the radiation from the fluorescent materials. The resultant electrical signals from the photosensors are amplified and compensated against daylight and cloudy effects of the medium, through an auxiliary amplifier.

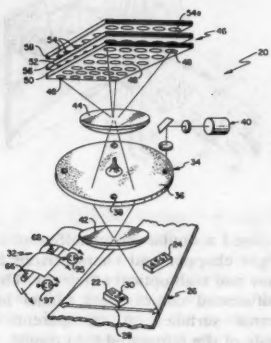
3,666,946

AUTOMATIC INFORMATION READING SYSTEM USING PHOTOLUMINESCENT DETECTION MEANS

Cebern B. Trimble, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Sept. 29, 1970, Ser. No. 76,493
Int. Cl. G01n *21/38*
U.S. Cl. 250—71 R **5 Claims**

A process for encoding data and apparatus for recording and retrieving the same. The encoding is accomplished by depositing, on an area for each datum of said data, a first plurality of binarily-weighted ink components, whose presence or absence defines the significant value of a digit, and a second plurality of binarily-weighted ink components, whose presence or absence defines the order of the digit. The inks used photoluminesce in distinct narrow wavebands when subjected to ultraviolet radiation. The apparatus for retrieving the data includes a source of ultraviolet radiation for periodically illuminating a scanning zone to where the data to be read is moved. A scanning device is used to scan the scanning zone during the period when the ultraviolet radiation is on, so as to detect the fluoresence of those ink components which are present. Each datum may also be so shaped as to be human-readable. An optical system is used to direct the detected fluoresence to an array of light-responsive members. Each member of the array is responsive to the fluorescence of only one ink component, thereby registering the presence or absence of that particular ink component in the data. Successive passes by the scanning device repeatedly scan the data, which may be randomly oriented relative to the scanning zone. Conventional logic circuitry may be used to interpret the output of the array of light-responsive members.

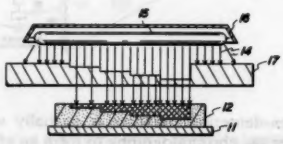


3,666,947

LIQUID CRYSTAL IMAGING SYSTEM HAVING AN UNDISTURBED IMAGE ON A DISTURBED BACKGROUND AND HAVING A RADIATION ABSORPTIVE MATERIAL DISPERSED THROUGHOUT THE LIQUID CRYSTAL

Werner Erwin Louis Haas, Webster; James E. Adams, Ontario; John B. Flannery, Jr., Webster, and Bela Mechlowitz, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,347
Int. Cl. G02f *1/16*
U.S. Cl. 250—83 R **25 Claims**



An imaging system wherein an imaging member comprising a composition comprising a material having a cholesteric liquid crystalline phase with radiation absorptive material dispersed throughout the liquid crystalline material, is provided with the liquid crystalline composition in its Grandjean or "disturbed" texture state, and the member is thermally

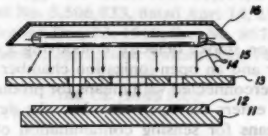
imaged by imagewise heating image portions of said imaging material to a temperature at least about the cholesteric liquid-isotropic transition temperature range of the material and allowing said heated portions of said imaging material to return to a temperature within the cholesteric liquid crystalline mesophase temperature range of said material, whereby said imaged areas assume the focal-conic or "undisturbed" texture state in the desired image configuration. Images provided by the inventive system may be erased, and the imaging members used therein are typically reuseable.

3,666,948

LIQUID CRYSTAL THERMAL IMAGING SYSTEM HAVING AN UNDISTURBED IMAGE ON A DISTURBED BACKGROUND

Bela Mechlowitz, Rochester; James E. Adams, Ontario, and Werner Erwin Louis Haas, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,348
Int. Cl. G02f *1/16*
U.S. Cl. 250—83 R **20 Claims**



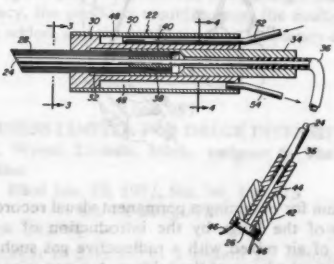
An imaging system wherein an imaging member comprising a material having a cholesteric liquid crystalline phase in its Grandjean or "disturbed" texture state is thermally imaged by imagewise heating image portions of said imaging material to a temperature at least about the cholesteric liquid crystalline-liquid isotropic transition temperature of said material and allowing said heated portions of said imaging material to return to a temperature within the cholesteric liquid crystalline mesophase temperature range of said material whereby said imaged areas assume the focal-conic or "undistrubed" texture state in the desired image configuration. Images provided by the inventive system are erasible, and the imaging members are reusable.

3,666,949

SHIELDED OPTICAL RADIATION DETECTING DEVICE

Frank A. De Falco, Marlboro, and Stephen N. Bobo, Cohasset, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 28, 1970, Ser. No. 76,182
Int. Cl. G01j *5/00*; G02b *5/16*
U.S. Cl. 250—83.3 H **10 Claims**



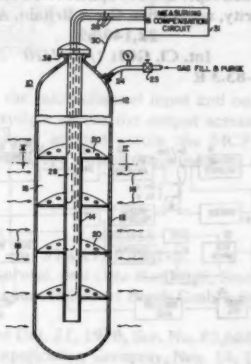
An optical radiation detecting device adapted particularly for temperature detection systems such as welding apparatus and which comprises a fluid-cooled fiber optic radiation sensing and transmitting means having means for shielding the sensing portion of the device from extraneous or stray radiation in the visible and near visible portions of the spectrum.

3,666,950

INTEGRAL MULTI-SENSOR RADIATION DETECTOR

Robert R. Ferber, Pittsburgh, Pa., and George A. Gilmour, Severna Park, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1969, Ser. No. 862,428
Int. Cl. G01t *1/18, 3/00*
U.S. Cl. 250—83.1 **11 Claims**



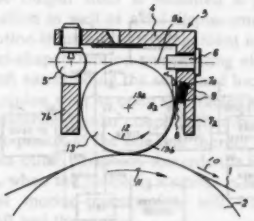
The invention is a radiation detector assembly comprising multiple independent radiation sensors positioned within a common gas enclosure and operated at substantially equal voltage.

3,666,951

DEVICE FOR DETECTING DEFECTS IN CONTINUOUS WEB MATERIAL

Kurt Gertung, Heikendorf near Kiel, Germany, assignor to Dr. Ing. Rudolf Hell

Filed Apr. 1, 1970, Ser. No. 24,479
Claims priority, application Germany, Apr. 16, 1969, G 69 15 129
Int. Cl. G01n *21/32*
U.S. Cl. 250—219 DF **10 Claims**



Elevational defects in a continuous web of material are detected by a sensing means including a vertically movable sensing roller positioned above a support roller and bearing down theretoward under the force of gravity so that it rests on the web supported by the support roller. Movement of the web in a first direction rotates the sensing roller in a first direction and causes the sensing roller to bear against a wiping means on a sensing roller retainer leg to remove any loose web material particles which may have adhered to the sensing roller so that false indications of elevational defects are prevented. The wiping means may include a blade ar-

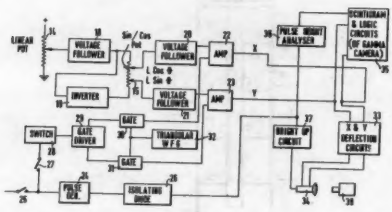
ranged at an angle against the direction of rotation of the sensing roller and the blade may be a rigid member in a yieldable support or a resilient member in a resilient or rigid support.

3,666,952

APPARATUS FOR INDICATING THE POSITION OF A REFERENCE MARKER USED IN A GAMMA RAY CAMERA

Victor Ralph McCready, Sutton, and Sidney Patrick Newbery, London, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 28, 1970, Ser. No. 32,647
Claims priority, application Great Britain, Apr. 30, 1969, 22,140/69
Int. Cl. G01t *1/16, 1/20*
U.S. Cl. 250—83.3 R **8 Claims**



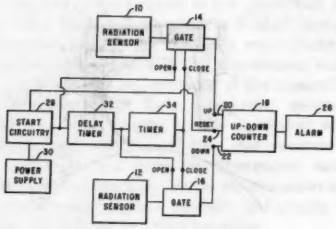
Apparatus for indicating the position of a reference marker is adapted for use with a medical gamma camera. A movable reference marker is coupled to a fixed reference member by an arm, and *x* and *y* co-ordinate voltages are generated and fed to a display screen of the gamma camera to produce a reference mark on the screen corresponding to the position of the marker.

3,666,953

UP-DOWN COUNTER FOR BACKGROUND COMPENSATION

William F. Splichal, Jr., San Jose, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 18, 1970, Ser. No. 64,714
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 R **3 Claims**



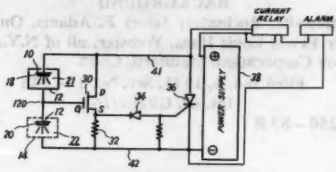
A radiation monitor provides a signal when contamination exceeds a minimum allowable proportion of background radiation. The monitor includes two sensors for separately measuring background and the total of background and contamination radiation. An up-down counter accumulates only background count for an initial time interval then deducts the total count for a second time interval while continuing to accumulate background count. Adjustable timer means allows the initial to second time interval ratio to be adjusted to set the minimum allowable contamination to background ratio. An alarm is activated if the contamination to background ratio exceeds the minimum allowable.

3,666,954

IONIZATION SMOKE DETECTOR AND LEAKAGE SENSING MEANS THEREFOR

Koju Sasaki, Tokyo; Naoki Takahashi, Fujisawa, and Akihiro Kobayashi, Yokohama, all of Japan, assignors to Nittan Company, Limited, Tokyo, Japan

Filed June 18, 1970, Ser. No. 47,427
Claims priority, application Japan, June 21, 1969, 44/48669
Int. Cl. G01t *1/18*; G08b *21/00*
U.S. Cl. 250—83.6 FT **5 Claims**



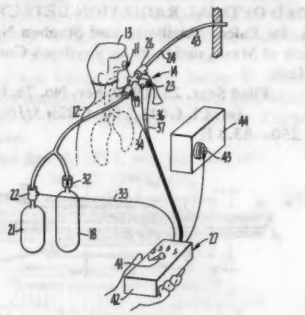
An ionization smoke detector embodying a closed ionization chamber and an open ionization chamber connected in series and interconnected with means for producing an alarm when smoke enters the open chamber, the detector further including means for sensing contamination of the leakage particularly between the electrodes in the open ionization chamber and producing an alarm when the leakage resistance falls below a selected value.

3,666,955

AUTOMATIC CONTROL SYSTEM FOR RADIOACTIVE REGIONAL VENTILATION STUDIES

Edgar L. Suprenant, 4729 Firmament Avenue, Encino, Calif.; Harold F. Rieth, P. O. Box 2102, Costa Mesa, Calif., and Clayton H. Douglas, 30489 Amber Sky Drive, Palos Verdes, Calif.

Filed July 8, 1970, Ser. No. 53,211
Int. Cl. G01t *1/20*
U.S. Cl. 250—106 T **9 Claims**



A system for obtaining a permanent visual record of the air passages of the lungs by the introduction of a measured quantity of air mixed with a radioactive gas such as Xenon (Xe^{133}) into the lungs of the subject. A conventional scintillation camera or other radioactive recording device is operated to produce a permanent visual record. A separate air reservoir provides non-tagged air to fill the breathing passages and confine the radioactive tagged air to the lungs. The apparatus operates in sequence to supply the desired quantity of

radioactive tagged air from a reservoir, followed by the measured quantity of ordinary air from a second reservoir, and then prevents exhalation during the time period necessary for the radioactive recording device to operate. The supply of premeasured quantities of tagged air and additional air insure that the subject will take only a normal size breath. Ganged stepping switches and a timing device provide automatic sequencing. A modified form of the apparatus utilizes a flexible wall radioactive gas reservoir and an associated pivoted lever which drops down to actuate a microswitch and open the valve to the additional air when the radioactive gas reservoir is depleted. A method is described in which measured quantities of tagged air and additional air are sequentially applied to the subject, exhalation is prevented during the period in which the radioactive recording is made, and exhalation is thereafter permitted.

3,666,956

METHOD AND APPARATUS FOR TELEMETERING BY MEANS UTILIZING MODULATED LIGHT BEAMS

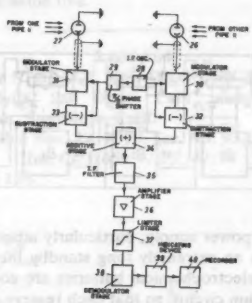
Friedrich Karl von Willisen, Zurich, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Continuation of application Ser. No. 601,646, Dec. 14, 1966, now Patent No. 3,506,833, dated Apr. 14, 1970. This application Dec. 23, 1969, Ser. No. 887,585

Claims priority, application Switzerland, Feb. 3, 1966, 1555/66

Int. Cl. H04b *9/00*

U.S. Cl. 250—199 **3 Claims**



A method and arrangement for transmission and electronic evaluation of a modulated light beam used for telemetry in which the modulation signal appears as an argument of a sinusoidal function. The modulated sinusoidal function is transformed into two parallel signals phase-shifted by $\pi/2$ which are subsequently converted at a receiving station into two correspondingly phase-displaced electrical signals. The electrical signals are then mixed multiplicatively with sinusoidal signals phase displaced by $\pi/2$ having a fixed angular frequency, the products resulting from the multiplicative mixing are added, and the latter are then frequency-demodulated.

3,666,957

BRIGHTNESS LIMITER FOR IMAGE INTENSIFIERS

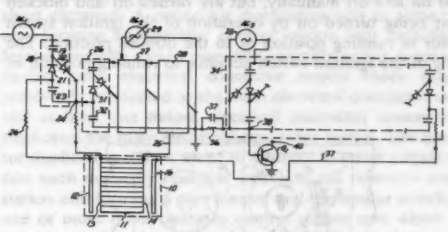
William R. Wyess, Livonia, Mich., assignor to The Bendix Corporation

Filed Jan. 25, 1971, Ser. No. 109,413

Int. Cl. E04g *17/06*

U.S. Cl. 250—213 VT **7 Claims**

The invention is directed to a system for automatically limiting the output brightness of an image intensifier having a microchannel plate (MCP). The intensifier includes a radiation-sensitive surface which is located in the proximity of the input surface of the MCP. An output screen is located in the proximity of the output surface of the MCP. The two surfaces of the MCP are maintained at different voltages which accelerate electrons through the MCP to cause the multiplication of electrons therein. The output brightness of the intensifier is directly proportional to the current supplied to the output screen. This current is dependent upon the voltage



supplied across the microchannel input and output surfaces. Therefore, the system senses the output screen current and changes the voltage applied across the MCP to limit the sensed current and the output brightness to some desired level.

3,666,958

STARTER DRIVE

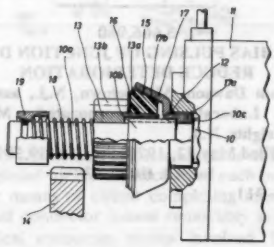
Walter Ruhle, Korntal, and Otto Barthruff, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 21, 1970, Ser. No. 82,608

Claims priority, application Germany, Nov. 14, 1969, P 19 57 233.9

Int. Cl. F02n *15/08*

U.S. Cl. 290—48 **9 Claims**



A starter drive for combustion engines has a motor on whose rotatable output shaft is mounted a pinion having freedom of rotation as well as axial displacement relative to the shaft. A motion-transmitting arrangement is provided, including a funnel-shaped motion-transmitting element rotatable with the shaft surrounding the same and located adjacent one end of the pinion with its open side facing the latter, and an elastically yieldable annular coupling member surrounding and fast with the pinion at the one end thereof and conically converging on its outer periphery towards the funnel-shaped element so that, when the coupling member is received in the latter, frictional motion-transmission will be established between the shaft and the pinion.

3,666,959

BATTERY PROTECTIVE MEMORY SYSTEM FOR AUTOMOTIVE VEHICLES

Clarence M. Crews, 4706 North Pacific Highway, Central Point, Oreg.

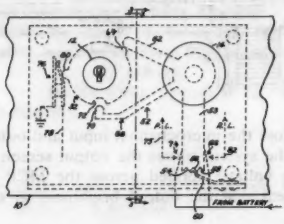
Filed Jan. 28, 1971, Ser. No. 110,547

Int. Cl. H02g *3/00*

U.S. Cl. 307—10 BP **6 Claims**

A novel battery protective system for automotive vehicles is provided in which both the running lights and the parking

lights are controlled by a common light switch operator, which operator is restricted, and in some circumstances actuated, by the key controlled, ignition switch actuator. In the normal, non-operating condition of the ignition switch actuator, according to my invention, the running lights are necessarily off and cannot be turned on. The parking lights may be turned on and off manually, but are turned off and blocked against being turned on by operation of the ignition switch actuator to running position or to the utilities position. The turning of the ignition switch actuator to running position or



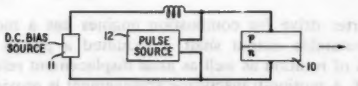
to utilities position makes possible the manual turning on and turning off of the running lights, but turns off the parking lights (if on) and blocks the turning on of the parking lights. Return of the ignition switch actuator to normal, non-operating position turns off the running lights but does not restore the parking lights. No running or parking lights will ever be turned on or left on immediately following the turning off of the ignition switch actuator. No running or parking lights will ever be turned on or left on immediately following the turning on of the ignition switch actuator. The system is foolproof.

3,666,960

REVERSE BIAS PULSING OF JUNCTION DIODES TO REDUCE DETERIORATION

Robert William Dawson, Middletown, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 22, 1970, Ser. No. 39,582
Int. Cl. H03k *17/00*
U.S. Cl. 307—311 **8 Claims**



The rate at which certain types of forward-biased p-n junction diodes deteriorate is significantly reduced by the periodic application of reverse bias pulses.

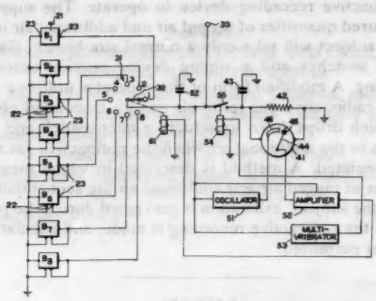
3,666,961

ELECTRICAL POWER SUPPLY

John C. Bogue, Santa Monica, and Robert I. Sarbacher, Arcadia, both of Calif., assignors to said Bogue, by said Sarbacher

Filed Nov. 24, 1969, Ser. No. 879,158
Int. Cl. H02j *7/00*
U.S. Cl. 307—65 **9 Claims**

An electrical power supply, particularly adapted for intermittent use, has an extremely long standby life. A series of squib actuated primary cell electrochemical reserve batteries are controlled by a selective activation circuit, so that each reserve battery of the series is activated only after the the preceeding battery has substantially spent its useful life. The circuit responds to a drop in battery output voltage signalling



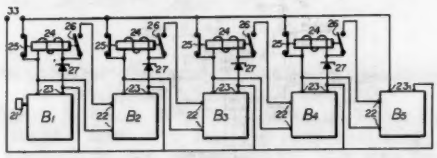
the end of the battery's useable life, to substitute the next battery in the series, and to activate it by firing its squib.

3,666,962

ELECTRICAL POWER SUPPLY

John C. Bogue, Santa Monica, and Robert I. Sarbacher, Arcadia, both of Calif., assignors to said Bogue, by said Sarbacher

Filed Dec. 15, 1969, Ser. No. 884,783
Int. Cl. H02j *7/00*
U.S. Cl. 307—65 **20 Claims**



An electrical power supply, particularly adapted for intermittent use, has an extremely long standby life. A series of squib actuated electrochemical batteries are controlled by a selective activation circuit, so that each reserve or secondary battery of the series is activated only after the preceeding battery has substantially spent its useful life. The circuit responds to a drop in battery output voltage or to an increase in gas pressure within the battery encapsulation signalling the end of the battery's useable life, to substitute the next battery in the series, and to activate it by firing its squib.

3,666,963

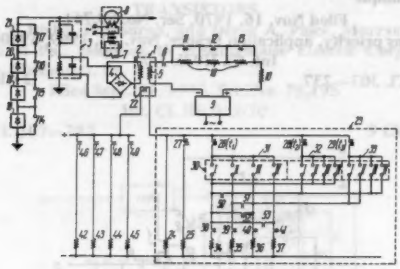
DEVICE FOR MATCHING NUMBER OF OPERATING BRIDGES ON CONVERTING SUBSTATIONS OF DIRECT-CURRENT TRANSMISSION LINES

Albert Efimovich Gurevich, ulitsa Ivana Chernykh, 1, kv. 13, Leningrad; Boris Fishelevich Rozenbljum, Artekovskaya ulitsa, 7, kv. 472, and Igor Nikolaevich Shaposhnikov, Chongarsky bulvar, 13, kv. 53, both of Moscow, all of U.S.S.R.

Filed Jan. 26, 1970, Ser. No. 5,473
Int. Cl. H02j *1/00*
U.S. Cl. 307—82 **2 Claims**

A device for matching the number of operating bridges on converting substations of a direct-current transmission line comprising a comparator for comparing the voltage of the transmission pole relative to earth with the voltage of an auxiliary source which depends on the number of the operating bridges of the transmission pole, a unit for disconnecting the bridges connected to the comparator and including actuating

elements and elements with various time delays, in which the unit for disconnecting the bridges has a switch for selecting the succession of disconnection of the bridges, the number of positions of the switch corresponding to the number of bridges of the transmission poles while the commutating circuits of the switch being subdivided into groups with the number of circuits in each group being equal to the number



of positions of the switch, in which case in each group the commutating circuits on one side are interconnected and are correspondingly connected to the elements with different time delays and on the other side the commutating circuits are connected to the actuating elements of the unit for disconnecting the bridges.

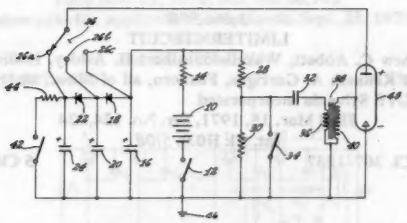
The device increases the reliability in controlling a direct-current transmission line.

3,666,964

ENERGY STORAGE AND DISCHARGE SYSTEM

Joseph E. Flynn, San Diego, Calif., assignor to Subsea Products, Inc., San Diego, Calif.

Filed Nov. 27, 1970, Ser. No. 93,101
Int. Cl. H05b 41/32, 41/38
U.S. Cl. 307—108 **13 Claims**



This system is for charging a plurality of capacitors connected in parallel. Only individual ones of the capacitors are discharged in accordance with the setting of a multi-position switch. Unidirectional members are included in the circuit for providing for the charging of all of the capacitors but the discharging of only the selected capacitors. When the capacitors discharge, they may trigger a flashtube which provides the light to take a photograph.

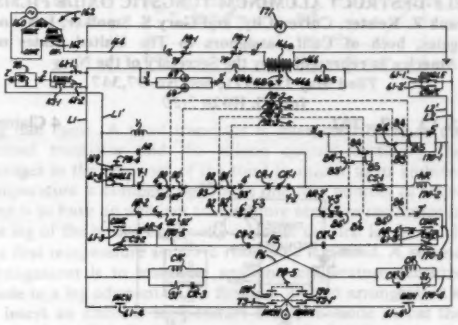
3,666,965

PRESS CONTROL APPARATUS

Kurt K. Luenser, Desota, Tex., assignor to Verson Allsteel Press Company, Chicago, Ill.

Filed Mar. 22, 1971, Ser. No. 126,809
Int. Cl. F16p 3/04
U.S. Cl. 307—112 **12 Claims**

Control apparatus and circuitry for controlling the movement of a press ram or the like including a main electrical connector means having pairs of contact terminals between which are to be connected normally open and normally closed manually operable switch means for operating the press ram or for stopping the same. The main connector means are also provided with another pair of contact terminals which, to permit operation thereof, must be externally short circuited. A connector duplicating unit in some cases also forming an operator control station unit including at least a normally closed manually operable switch is provided having input electrical connector means which may be removably connected to the main electrical connector means and at least one output electrical connector means which duplicates the main electrical connector means. The connector duplicating unit is wired to connect in series circuit relation each manually operable switch of the operator control station unit forming a part thereof and the similar switches of one or more other operator control station unit which may be connected to the one or more output electrical connector



means thereof. The circuit of the connector duplicating unit must be completed by the connection to each output electrical connector means of circuit completing means including input electrical connector means removably secured to the output electrical connector means involved. Such circuit completing means may be a terminal operator control station unit or dummy unit not requiring other units to be connected thereto or another combination connector duplicating and operating control station unit requiring such other unit. Any operator control station unit having a normally open switch means is provided with short circuit means for short circuiting the aforementioned other pair of contact terminals of the main electric connector means and any dummy unit or operator control station unit having only normally closed switch means is devoid of any short circuit connections for the aforesaid other pair of contact terminals so that the mistaken connection of such a dummy unit or operator control station unit into the main electrical connector means cannot effect the operation of the press control circuit.

3,666,966

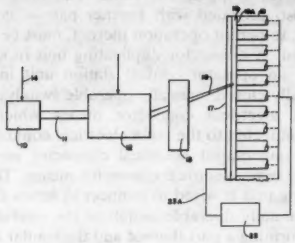
ELECTRONIC SWITCH

Wolfgang Joseph Buss, 21-2601 7th Street East, Saskatoon, Saskatchewan, Canada

Filed July 21, 1970, Ser. No. 56,823
Int. Cl. H01h 47/24
U.S. Cl. 307—117 **3 Claims**

A device for connecting a conductor electrically to one out of a number of conductor by means of a photoconductive or semi-conductive material and a light or electron beam. The

particular output to be connected to the common input is chosen by selecting the direction or the spatial position of a



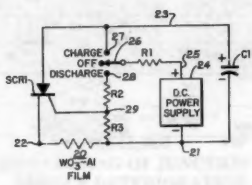
light beam. The resistance of the connection depends on the intensity of the beam.

3,666,967

SELF-DESTRUCT ALUMINUM-TUNGSTIC OXIDE FILMS

Frank Z. Keister, Culver City, and Gary S. Smolker, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 12, 1971, Ser. No. 97,347
Int. Cl. H02h *7/20*
U.S. Cl. 307—202 **4 Claims**



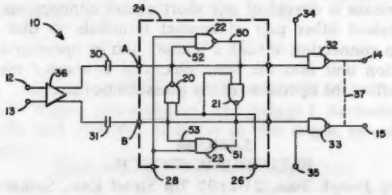
A multilayer thin film circuit board having thin film layers of the thermite reaction class, such as tungstic oxide and aluminum materials, coupled to a switched voltage source to be switched in circuit to cause ignition of the thermite layer and cause destruction of the film circuit.

3,666,968

LOW LEVEL PULSE POLARITY DETECTOR

Thomas L. Krocheski, Burnsville; Samuel A. Meddaugh, St. Paul, and John W. Staubus, Minneapolis, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,809
Int. Cl. H03k *19/36*
U.S. Cl. 307—236 **9 Claims**



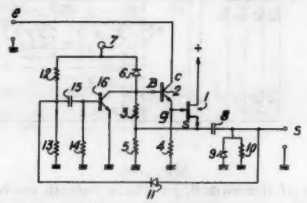
A semiconductor circuit for determining the relative polarity of the output of a binary memory system is described. The circuit includes four NAND circuits intercoupled as a flip-flop driving two NAND circuits intercoupled as strobed output gates. The relative polarity of the memory system output signal sets the flip-flop in a corresponding one of its two stable states with the strobed output gates emitting the binary significance of the memory system output signal.

3,666,969

DEVICE FOR CLIPPING ELECTRICAL SIGNALS

Christian Carriere, 75 Paris, and Roger Dupont, 91 Evry, both of France, assignors to Commissariat a L'Energie Atomique

Filed Nov. 16, 1970, Ser. No. 89,761
Claims priority, application France, Nov. 21, 1969, 6940054
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **2 Claims**



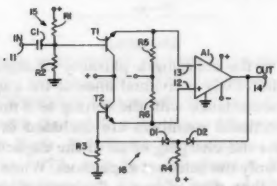
The clipping device comprises a first field-effect transistor in which the grid terminal is connected to the emitter of a second transistor, the source terminal is connected to ground through a first resistor, the drain terminal is connected to a supply source and the clipped signal is available at the source terminal; a second transistor in which the emitter is connected to ground through a second resistor, the base is connected to the source terminal of the first field-effect transistor through a third resistor and the collector constitutes the input of the clipping circuit; a diode connected between the base of the second transistor and a second voltage source in a direction which causes the diode to cut-off when the base-ground voltage of the second transistor is lower at absolute value than the value of the voltage of the second voltage source.

3,666,970

LIMITER CIRCUIT

Matthew C. Abbott, Wakefield; Albert H. Ashley, Holliston, and Kenneth A. Garrigus, Foxboro, all of Mass., assignors to GTE Sylvania Incorporated

Filed Mar. 15, 1971, Ser. No. 124,224
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **5 Claims**



A limiter circuit employing a high gain differential voltage comparator. A positive quiescent voltage is established on the inverting input of the comparator at which input signals are applied. The output of the comparator is coupled to the non-inverting input through a feedback arrangement so as to establish a threshold voltage which is positive with respect to the quiescent voltage until the input signal exceeds the positive threshold voltage and the output of the comparator changes from a high to a low level. Then the feedback arrangement establishes a threshold voltage which is negative

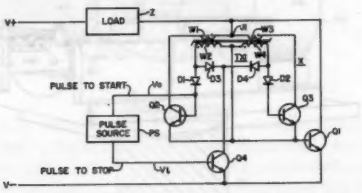
with respect to the quiescent voltage until the input signal exceeds the negative threshold voltage and the output of the comparator changes from the low to the high level. Thus, a square-wave output is produced at the output of the comparator.

3,666,971

PULSE CONTROL DRIVE SYSTEM FOR POWER TRANSISTORS

Bryan J. Bixby, Pittsburgh, and Derek A. Paice, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1970, Ser. No. 75,195
Int. Cl. H03k *3/30*
U.S. Cl. 307—282 **9 Claims**



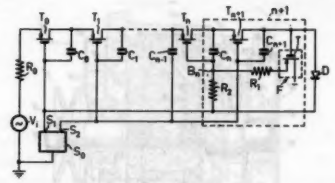
A drive system for a power device, such as a power transistor, for supplying a load wherein an oscillator is provided including a pair of devices, such as transistors, coupled by a transformer, which may comprise a saturable transformer, wherein the oscillator devices are alternately conductive and are connected in a Darlington circuit arrangement with the power devices to supply drive current thereto when conductive.

3,666,972

DELAY DEVICE

Frederik L. J. Sangster, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1970, Ser. No. 88,742
Claims priority, application Netherlands, Sept. 25, 1970, 7014135
Int. Cl. H03k *17/26*
U.S. Cl. 307—293 **4 Claims**



A capacitive delay device comprising a sequence of capacitances which have been interconnected by the main current path of at least one transistor, a feedback path being provided between the output electrode of at least one transistor and the input electrode thereof.

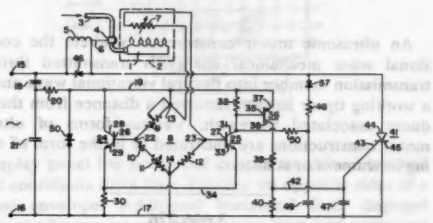
3,666,973

SOLID STATE ELECTRONIC THERMOSTAT

William H. Hulsman, Jr., Needham, Mass., assignor to Control Design, Inc., Needham, Mass.

Filed Aug. 19, 1970, Ser. No. 65,130
Int. Cl. H03k *17/00*
U.S. Cl. 307—310 **2 Claims**

An apparatus for controlling the temperature of a device such as an oven in which a resistance having a positive temperature coefficient of resistance is incorporated in one leg of a bridge and is used to detect the temperature to be controlled. The bridge is energized by an alternating voltage and any unbalance appears across output terminals which are connected respectively to the bases of a first and a second transistor also energized with the same alternating voltage. The emitters of the transistors are connected together and through a common resistance so that the initiation of current flow through one transistor will inhibit current flow through the other. Flow of current through the second transistor triggers a silicon control rectifier which in turn controls a valve which supplies fuel to a burner in the oven. The voltage supplied to the bridge leads the voltage on the control rectifier so that it is always triggered at the beginning of its conducting half cycle. A third transistor is interposed between the second transistor and the silicon control rectifier. The changes in the response of the third transistor to its ambient temperature is compensated for in one of a number of ways. One is to have an ambient temperature sensitive resistance in the leg of the bridge diagonally opposite the first leg in which the first temperature sensitive resistance is placed. A second arrangement is to insert an ambient temperature sensitive diode in a leg adjacent to the first leg. A third arrangement is to insert an ambient temperature sensitive diode across the base and emitter of the third transistor. A delay circuit is provided for charging a condensor to delay the operation of the second transistor, the charge of said condensor being permitted to build up upon the initiation of current through the first transistor.

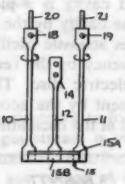


3,666,974

TORSIONAL FORK TRANSDUCERS

Frank Dostal, Elmhurst, N.Y., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Jan. 16, 1970, Ser. No. 3,349
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.2 **8 Claims**



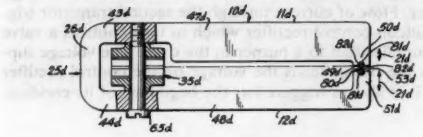
A torsional fork transducer wherein the two lines of the fork are interconnected at their feet by a piezoelectric crystal operating in the longitudinal mode, the crystal being energized at a rate determined by the natural frequency of the fork to effect torsional vibration of the tines. Oscillators derived from a pick-up electrode on the crystal are applied to the input of an electronic amplifier whose output is fed to a drive electrode on the crystal to sustain the fork in vibration.

3,666,975

ULTRASONIC MOTORS

Lewis Balamuth, New York, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Filed May 18, 1970, Ser. No. 38,149
Int. Cl. H01v 7/00
U.S. Cl. 310—8.2 4 Claims



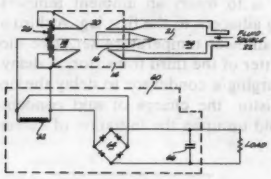
An ultrasonic motor construction wherein the compressional wave mechanical energy is transmitted through a transmission member into flexural vibrational wave energy to a working tip or surface removed a distance from the transducer associated therewith. Various forms of ultrasonic motor constructions are illustrated as in the form of a welding instrument or scissor.

3,666,976

FLUID OPERATED ELECTRIC GENERATOR UTILIZING A PIEZOELECTRIC DEVICE

Robert D. Gourlay, Canoga Park, Calif., and Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 10, 1965, Ser. No. 529,895
Int. Cl. H03k 3/35
U.S. Cl. 310—8.8 10 Claims



A fluid operated electric generator to convert fluid source energy, for example, in a rapidly moving vehicle or projectile to usable electrical power. The generator comprises an acoustic oscillator including an annular nozzle and an acoustically resonant cavity coaxial with the nozzle and spaced therefrom. The resonant cavity comprises a cylindrically shaped pipe having an annular knife edge facing the nozzle. Positioned at the bottom of and forming the end of the cylindrically shaped cavity is a piezoelectric disc. The fluid directed toward the cavity by the nozzle, upon striking the knife edge, produces acoustic oscillations which are stabilized at a single frequency by the resonant cavity and are coupled to the piezoelectric disc. The piezoelectric disc responsive to displacement by the acoustic oscillations provides an electrical signal at the oscillating frequency.

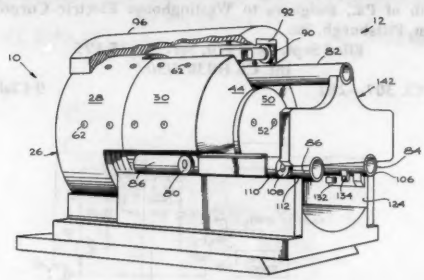
3,666,977

LINEAR POSITIONER

Clifford J. Helms, Calabasas Park, and Stelios B. Papadopoulos, Westlake Village, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 10, 1970, Ser. No. 71,013
Int. Cl. H02k 41/02
U.S. Cl. 310—13 13 Claims

A linear positioner particularly useful for rapidly and precisely positioning heads with respect to a magnetic disc recording surface. The positioner includes a linear motor having a cylindrical core of magnetically permeable material and a motor housing, also of permeable material, closely magnetically coupled to the ends of the core. Permanent magnets are mounted on the inner surface of the housing, between the ends thereof, to produce a magnetic field across an air gap to the core which is of substantially uniform density along the length of the core. A coil assembly, including a rigid edge-wound drive coil mounted around the core in the air gap, is supported for horizontal movement along the core by a plurality of roller bearings. The roller bearings are mounted on bearing support rods secured to the drive coil structure and spaced around the circumference thereof. Some of the bearings are mounted for rotation about vertical spindle axes so as to engage vertical rail surfaces while other bearings are mounted for rotation about horizontal spindle axes so as to engage horizontal rail surfaces. At least some of the bearings are flexibly mounted in order to preload the bearings and assure that they roll properly on the rail surfaces.

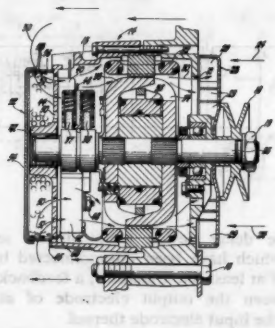


3,666,978

SIDE PORTED INLET COVER FOR GENERATORS

Glen R. Renner, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1970, Ser. No. 92,638
Int. Cl. H02k 9/06
U.S. Cl. 310—62 1 Claim



A cylindrical-like cover, the end of which is impervious to air flow and the axially extending sides of which have ports, is adapted to be removably attached to one side of a ducted end wall of an alternator housing. A voltage regulator and rectifier comprised of semiconductors are attached to the other side of the end wall in proximity to the air ducts and are cooled by means of a fan that draws air in radially through the ports in the cover when attached and axially through the ducts in the end wall. Debris of a size greater than the ports or a momentum in excess of that which can be

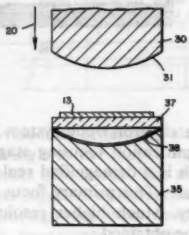
overcome by the suction of the alternator fan is blown over the exterior of the alternator and cover by the motor fan. This prevents debris from clogging the end wall and the ducts therein, reduces the tendency of the semiconductor to overheat from the effects of such clogging, and avoids possible charging system faults associated therewith.

3,666,979

FOCUSED PIEZOELECTRIC TRANSDUCER AND METHOD OF MAKING

Jerry T. McElroy, Boulder, Colo., assignor to Automation Industries, Inc., Century City, Los Angeles County, Calif.

Filed June 17, 1970, Ser. No. 46,897
Int. Cl. H04r *17/00*; G01n *29/04*
U.S. Cl. 310—9.6 11 Claims



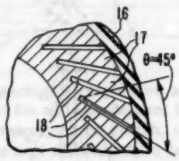
An apparatus and method for fabricating focused high frequency electromechanical transducers especially useful in ultrasonic inspection apparatus is disclosed. An initially flat or planar piezoelectric crystal is placed between a pair of members having mating surfaces contoured to correspond to the desired shape of the crystal. When the members are forced together the crystal is bent or otherwise formed into the desired shape.

3,666,980

DEPRESSABLE BEAM COLLECTOR STRUCTURE FOR ELECTRON TUBES

Samuel Robert Jackson, Santa Clara, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Oct. 20, 1970, Ser. No. 82,376
Int. Cl. H01j *19/36*
U.S. Cl. 313—39 9 Claims



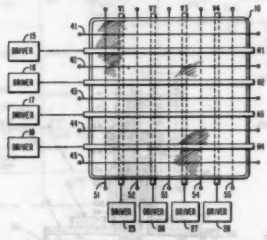
A depressible beam collector structure for electron beam tubes is disclosed. The beam collector structure includes a metallic beam collector electrode for collecting and dissipating energy of the beam. An electrically insulative ceramic sleeve surrounds the beam collector electrode for electrically insulating the collector electrode relative to the surrounds of the insulator body. An array of yieldable metallic thermally conductive cantilever fins are interposed between and interconnect the beam collector electrode with the surrounding insulative sleeve for providing a thermally conductive path therebetween. The yieldable cantilever fins conduct heat from the collector to the insulator and thence to the surrounds while preventing transmission of stress due to differential thermal expansion to the brittle insulator.

3,666,981

GAS CELL TYPE MEMORY PANEL WITH GRID NETWORK FOR ELECTROSTATIC ISOLATION

Frank M. Lay, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1969, Ser. No. 886,100
Int. Cl. H01j *17/04*
U.S. Cl. 313—190 6 Claims



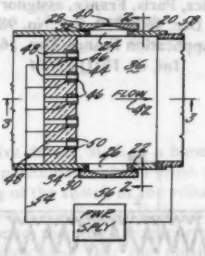
A display panel has horizontal coordinate drive lines and vertical coordinate drive lines disposed on opposite sides of a gas-filled envelope. Additional horizontal lines disposed between the horizontal coordinate drive lines and additional vertical lines disposed between the vertical coordinate drive lines may be left unconnected or floating, or they may be connected to a common potential. The additional horizontal lines and the additional vertical lines constitute a grid network which electrostatically shields each gas cell from all remaining gas cells defined by the coordinate intersections of the vertical and horizontal coordinate drive lines.

3,666,982

DISTRIBUTIVE CATHODE FOR FLOWING GAS ELECTRIC DISCHARGE PLASMA

Walter J. Wiegand, Jr., Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 20, 1970, Ser. No. 21,259
Int. Cl. H01j *17/06*
U.S. Cl. 313—205 5 Claims

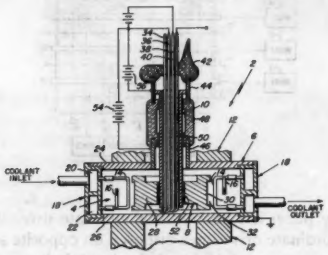


A cathode emitting electrons to form an electric discharge plasma in a flowing gas stream is oriented and disposed to cause a substantially uniform distribution of the emitted electrons throughout the gas stream. A segmented cathode embodiment permits a large surface area, the large area in turn allowing a maximum cooling effect from the flowing gas. The cathode segments are dispersed and interspersed with insulating material to avoid the current concentrations otherwise occurring at the intersections of the individual cathode segments. Also cooling limitations require that the cathode surfaces be substantially parallel to the flowing gas stream. Various configurations are disclosed for providing a proper cathode electron emission area within varying flow cross-sectional areas.

3,666,983
WAVE PROPAGATING STRUCTURE FOR CROSSED FIELD DEVICES

Hans-Joachim Krah, Burlington; John S. Sklenak, Sudbury, and William A. Smith, Winchester, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 28, 1970, Ser. No. 101,678
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 6 Claims

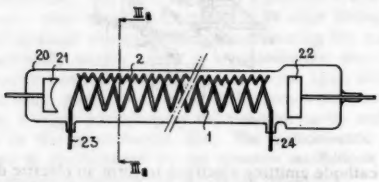


A wave propagating structure having broad bandwidth capability is disclosed for crossed field electron beam interaction devices. The thermal dissipation characteristics are programmed and customized taking into consideration beam coupling impedance, dielectric loading and suppression of undesired space harmonic modes. A structure such as a modified helix delay line is arranged with groupings of individual elements in parallel and such groupings are serially connected. A fluid coolant is circulated through the delay line and the dielectric constant characteristics of such coolant may be selected to vary the frequency determining dispersion parameters of predetermined portions of the propagating wave.

3,666,984
WIDE-BAND HIGH-POWER DELAY LINE

Gerard Kantorowicz, Paris, France, assignor to Thomson-CSF

Filed Dec. 16, 1970, Ser. No. 98,615
Claims priority, application France, Dec. 16, 1969, 6943510
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 7 Claims

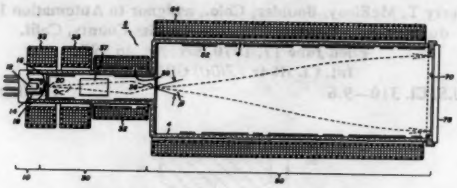


In a delay line of an electron tube for amplifying or generating microwaves, externally of and parallel to a main conductor helix within which an electron beam travels axially, there extends a secondary helix which has a pitch and a diameter half the size of those of the main helix and which is so arranged that its turns electrically contact those of the main helix at several locations along a generatrix common to both helices. The field effect generated by the secondary helix substantially diminishes parasitic phenomena that appear in a delay line having a main helix of large diameter.

3,666,985
HIGH RESOLUTION ELECTRON OPTIC SYSTEM FOR CAMERA TUBES

Kurt Schlesinger, Fayetteville, N.Y., assignor to General Electric Company

Filed Oct. 20, 1969, Ser. No. 867,829
Int. Cl. H01j 29/56
U.S. Cl. 315—31 5 Claims



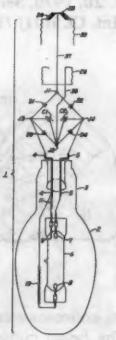
A high resolution electron optic system for camera tubes comprises a demagnification focusing stage which forms a primary focus which is a demagnified real image of a small spot-defining aperture. This primary focus is then projected into the FPS cavity. Much higher resolution and greater beam currents can be obtained.

Correction of scan distortion resulting from the cycloidal motion of the beam in the FPS cavity is obtained by twisting the deflection electrodes bounding the FPS cavity.

3,666,986
INTERNALLY RESISTIVELY BALLASTED DISCHARGE LAMP CONTAINING BRIDGE RECTIFIER

William H. Lake, Novelty, and Nicholas W. Medendorp, Willowick, both of Ohio, assignors to General Electric Company

Filed July 15, 1970, Ser. No. 54,880
Int. Cl. H01j 61/56
U.S. Cl. 315—49 12 Claims



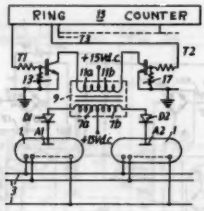
A discharge lamp comprising an arc tube and an incandescible filament connected in series within an outer jacket. An integral four-diode bridge rectifier operates the lamp on rectified alternating current and the filament limits the current through the arc tube. The lamp operates reliably with a greater proportion of the line voltage applied across the arc tube than in conventional resistively ballasted lamps, resulting in higher efficiency. One or more diodes may be paralleled by a small capacitor to provide a voltage doubling effect to start the lamp.

3,666,987

NUMBER GLOW TUBES HAVING TRANSFORMER ENERGIZING CIRCUITS

James John Drage, Uxbridge, England, assignor to Sumlock Anita Electronics Limited, Uxbridge, Middlesex, England

Filed Nov. 9, 1970, Ser. No. 87,875
Claims priority, application Great Britain, Nov. 13, 1969, 55,651/69
Int. Cl. H01j 17/48
U.S. Cl. 315—84.6 12 Claims



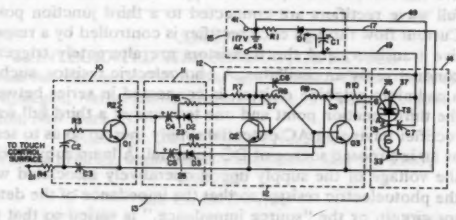
Apparatus is provided for generating electrode voltage for a number tube utilizing a center-tapped transformer to transmit pulses to a number tube anode. The transformer primary is center-tapped and supplied with opposing pulse potentials at the outer ends through non-linear resistors at a time corresponding to the appearance of voltage on a selected cathode electrode. A d.c. bias potential is connected to the tube anode to complement the pulse voltage of the transformer. The pulses are derived from a ring counter.

3,666,988

TOUCH SENSITIVE POWER CONTROL CIRCUIT

Robert E. Bellis, 700 7th Street, Boulder City, Nev.

Filed Jan. 22, 1970, Ser. No. 4,887
Int. Cl. H01h 35/00; H03k 17/72; H05b 37/02
U.S. Cl. 315—208 5 Claims



Disclosed is a capacitance responsive and touch sensitive power control circuit for an incandescent lamp or the like. A bidirectional AC semiconductor switch, such as a TRIAC, operatively connects and disconnects a lamp in series with power supply terminals, and the bidirectional semiconductor switch is alternately driven to conduction and nonconduction by a bistable flip-flop. A touch signal input circuit provides a triggering signal for the bistable flip-flop in response to body capacitance input signals applied thereto.

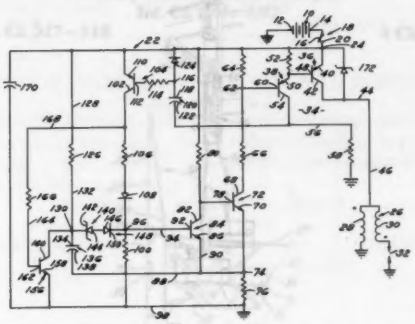
3,666,989

IGNITION SYSTEM SUPPLYING CONTINUOUS SOURCE OF SPARKS

Wesley D. Boyer, Franklin, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1969, Ser. No. 813,002
Int. Cl. H05b 37/02
U.S. Cl. 315—219 8 Claims

An ignition system providing a continuous source of spark ignition pulses for igniting a fuel-air mixture. The ignition system includes solid state circuit means for providing a substantially constant spark repetition rate and constant spark energy over a wide range of input voltages.

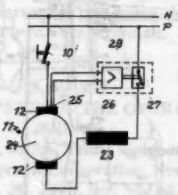


3,666,990

OVERLOAD PROTECTOR FOR ELECTRIC MOTORS WITH BRUSHES

Georg Strobl, Buhl, and Klaus Sander, Hofingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 13, 1971, Ser. No. 143,067
Claims priority, application Germany, June 6, 1970, G 70 21 203.2
Int. Cl. H02h 7/06, 5/04
U.S. Cl. 317—13 C 6 Claims



A heat responsive device, such as a bimetallic switch or a thermo couple, is positioned within a brush of the motor. The opening or closing of the switch or the voltage from the thermo couple, operates a relay or an electronic switch, such as a thyristor to disconnect the motor from current when the temperature, as an indication that the maximum permissible operating temperature of the motor has been exceeded, within the brush rises above a certain value.

3,666,991

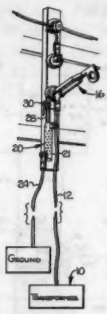
RESONANCE SUPPRESSING METHOD AND APPARATUS

Herman B. Wolf, Charlotte, N.C., assignor to R. H. Bouligny, Inc., Charlotte, N.C.

Filed Nov. 23, 1970, Ser. No. 91,939
Int. Cl. H02h 7/04
U.S. Cl. 317—14 5 Claims

Resonance effects otherwise possibly occuring upon a change in energization of an unloaded power transformer having leads connected in a main alternating current electrical circuit are suppressed through the temporary connection

of a resonance suppressing impedance between a lead of the transformer and an electrical ground, with such electrical



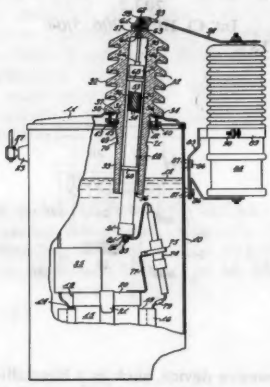
connection being maintained only through a change in the state of energization of the unloaded transformer.

3,666,992

PROTECTIVE MEANS FOR DISTRIBUTION TRANSFORMER

Ernest A. Goodman, Pittsburgh, Pa., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Oct. 22, 1970, Ser. No. 83,070
Int. Cl. H02h 7/04
U.S. Cl. 317—15 **10 Claims**



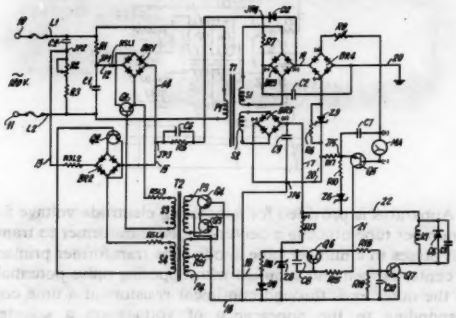
A distribution transformer for use on a high voltage power distribution system having high fault current capability is protected over the entire range of fault currents by a secondary breaker which opens on low magnitude currents caused by secondary faults, a protective link which melts on low magnitude primary fault currents, and in series with the protective link a current limiting fuse which does not operate in the low fault current range but interrupts low impedance, high magnitude primary fault currents. The current limiting fuse is disposed within the axial bore in a primary bushing having a conductive line shield on its inner surface to eliminate high voltage gradients in the vicinity of the fusible elements of the current limiting fuse and thus minimize corona and radio frequency voltage, and the conductive line shield is terminated at a point which provides enough electrical clearance between the line shield and the lower terminal of a melted current limiting fuse to prevent a fuse restrike or a physical or electrical bushing failure.

3,666,993

STATIC HAZARD DETECTOR FOR ISOLATED ALTERNATING CURRENT SUPPLY LINES

Raymond H. Legatti, Clearwater, Fla., assignor to Electromagnetic Industries, Inc., Clearwater, Fla.

Filed May 13, 1971, Ser. No. 143,096
Int. Cl. H02h 3/28
U.S. Cl. 317—18 R **12 Claims**



First and second resistors are connected in series with respective capacitors at first and second junction points. The two R-C series combinations are connected between the two line conductors of an isolated AC supply line, with each capacitor being connected to a different line conductor. Each junction point is connected to one terminal of a respective full wave rectifier, and the opposite terminals of the two full wave rectifiers are connected to a third junction point. Current flow through each rectifier is controlled by a respective transistor, and the transistors are alternately triggered conductive by an oscillator. A photoelectric resistor, such as a cadmium sulphide resistor, is connected in series between the third junction point and one terminal of a third full wave rectifier having an AC potential supply thereto so as to serve as an interposed source of DC potential. A lamp subjected to the voltage of the supply line is operatively associated with the photoelectric resistor so that the impedance of the detector circuit, or the "source impedance," is varied so that the detector current is maintained at a constant value over the entire voltage range of from 102v to 132v, for a nominal 120v AC supply.

The other terminal of the DC source is connected to one terminal of a milliammeter whose opposite terminal is grounded, and diode means are connected to the millianmeter so that fault current can flow therethrough in only one direction. The milliammeter, through the mentioned circuitry, is connected alternately to the first and second junction points for flow of fault current alternately from the line conductors in only one direction to ground through the milliammeter. A switching relay controls signal lights and an alarm, and normally maintains a "safe" lamp illuminated. Upon occurrence of a fault current flow through the milliammeter, an amplifier amplifies the fault current to energize the relay to switch connections to sound an alarm, to illuminate a "hazard" lamp, or to do both. Phase shift adjustment means are associated with the R-C series combinations, and a diode is connected in by-pass relation with the third full wave rectifier to direct reverse current flow in by-pass relation to the third full wave rectifier.

3,666,994

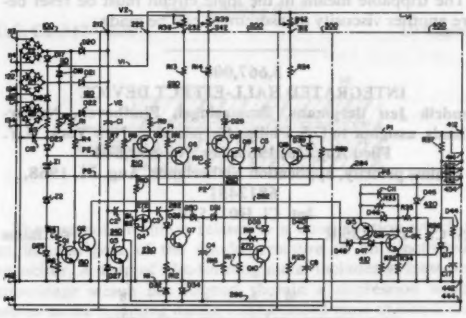
OVERCURRENT PROTECTIVE DEVICE

John D. Watson, Portsmouth, England; Francis T. Thompson, Murrysville, Pa., and Frederick O. Johnson, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of application Ser. No. 765,584, Oct. 7, 1968. This application June 18, 1970, Ser. No. 47,625

Int. Cl. H01h 47/18

U.S. Cl. 317—36 TD 9 Claims



An overcurrent protective device of the time delay type is provided which is responsive to the current in an electrical circuit which is being protected. The protective device includes means for producing periodic output pulses of current each having substantially a predetermined width or duration, the frequency and magnitude of said pulses both varying with the current to which the device is responsive. When the current in the associated circuit increases to a predetermined level or value, the pulses are applied to a timing or integrating capacitor to provide an output voltage which varies in a substantially linear manner with the square of the current to which the protective device is responsive.

3,666,995

INTEGRATED SEMICONDUCTOR DEVICE

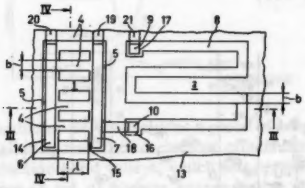
Bernardus Leonardus Wensink, and Adriaan Cense, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1970, Ser. No. 32,694

Claims priority, application Netherlands, May 10, 1969, 6907227

Int. Cl. H01l 19/00

U.S. Cl. 317—101 A 4 Claims



In an integrated semiconductor device according to the invention, a resistance element with small resistance comprises between its electric connections a number of parallel arranged resistance zones of the same width and thickness. The influence of inaccuracies in providing the electric connections is eliminated, and a zone of a resistance element with large resistor may have the same width and thickness as the parallel zones of the resistance element with small resistance.

3,666,996

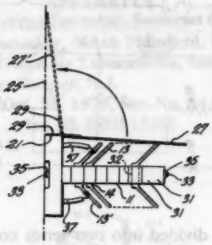
TELEPHONE LINE TERMINAL BLOCK COVER

Bryce H. Brown, Devon Manor, Pa., assignor to Darr R. Brown, Lansing, Mich., a part interest

Filed Sept. 3, 1970, Ser. No. 69,359

Int. Cl. H01r 9/02

U.S. Cl. 317—118 4 Claims



An improved telephone line terminal block cover is disclosed. The particular block to which the invention has application is a horizontally mounted terminal block having upper and lower matched arrays of terminal clips projecting upwardly and downwardly from the upper and lower horizontal surfaces of the terminal block, respectively. The disclosure presents a flat, rigid, acid-solder resistant hinged terminal guard. The specific structure includes a hinged plexiglass or cellulose acetate door, overlying the upwardly extending terminal clips. The door is swingable upon the hinges upwardly away from the metal clips, to gain access thereto. The door shields the terminal ends from electrical shorting by accidentally dropped objects, and also guards against other terminal fouling debris, including wire clippings and/or solder drippings from soldering operations at higher level rows or banks of similar horizontally mounted terminal blocks; the guard also acts as a personnel protecting device, preventing accidental body contact with the terminals.

3,666,997

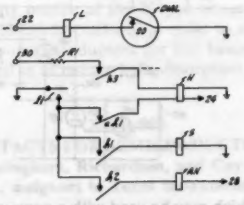
CIRCUIT FOR SPEEDING THE OPERATION OF A RELAY

Marvin Forrest Malm, Milan, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,519

Int. Cl. H01h 47/22

U.S. Cl. 317—123 6 Claims

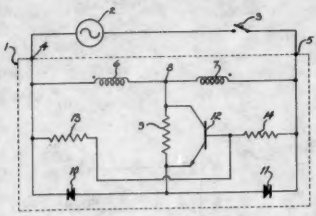


The operation of a relay is speeded up by placing its windings in series with the energized windings of a second relay. Collapse of the magnetic field in the windings of the second relay produces an EMF which is greater than that normally available for the operation of the first relay thereby causing the first relay to be energized with a higher potential, and to operate more quickly.

3,666,998
RELAY INPUT CIRCUIT

Wayne H. Wielebski, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 4, 1971, Ser. No. 112,530
Int. Cl. H01h 47/04
U.S. Cl. 317—123 8 Claims

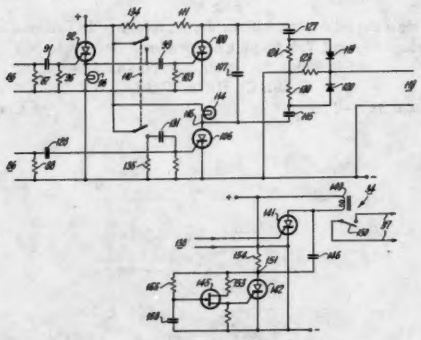


A relay coil is divided into two series connected sections and a dissipation resistor is connected in series with one lead of both sections to improve the drop out response of the relay. The dissipation resistor is shunted by a transistor the base of which is connected through coupling resistors to the other leads of the coil sections. The transistor operates as a switch to short circuit the dissipation resistor when power is applied to the relay coil to retain the pick up response of the relay. An alternative embodiment has a single coil section and coupling resistor. The dissipation resistor is connected to one lead of the coil section and the coupling resistor connects the transistor base to the other lead.

3,666,999
APPARATUS FOR PROVIDING SIGNALS CORRESPONDING TO THE VISCOSITY OF A LIQUID

Sam L. Moreland, Jr., Groves, Tex.; Nelson B. Haskell, Jefferson County, and Thomas B. Smitherman, East Baton Rouge Parish, both of La., assignors to Texaco, Inc., New York, N.Y., by said Moreland

Filed June 22, 1970, Ser. No. 48,243
Int. Cl. H01h 47/24, 47/32
U.S. Cl. 317—127 13 Claims



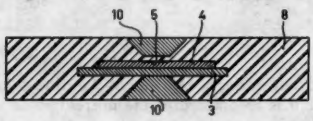
Apparatus, which may be used with a computer, senses the passage of the meniscus of a liquid column between two predetermined levels. The time for the passage of the meniscus of the liquid column corresponds to the viscosity of the liquid. As the meniscus of the liquid column passes between a light source and a photo tube arranged at each predetermined level, the quantity of light from the light source reaching a photo tube changes causing an output from the photo tube to change accordingly. Trigger circuits convert the changes in the photo tube outputs to pulses. A logic circuit has two input circuits, each input circuit being connected to a different trigger circuit and having trippable means. Each trippable means is tripped by the first pulse from a corresponding trigger circuit so that the logic circuit is responsive to only the first pulse from each trigger circuit to provide two output pulses. The time interval between the two output pulses is substantially equal to the passage time of the liquid column. A relay is energized in response to the two output pulses from the logic circuit for the time interval between the two output pulses to effectively provide input signals to the computer which may compute the liquid's viscosity.

The trippable means in the logic circuit must be reset before another viscosity measurement can be made.

3,667,000
INTEGRATED HALL-EFFECT DEVICE

Hendrik Jan Bergmans, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 25, 1969, Ser. No. 852,644
Claims priority, application Netherlands, Aug. 31, 1968, 6812451
Int. Cl. H01l 5/00
U.S. Cl. 317—235 R 4 Claims

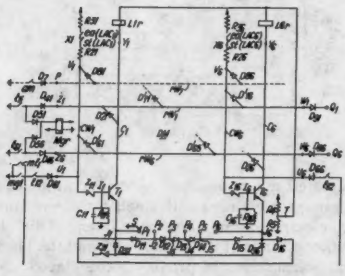


An integrated Hall-effect device is described in which a part of a semiconductor body serves as a Hall element and in which an amplifier circuit is incorporated in the remaining part, which semiconductor body is connected to conductors and is incorporated in an envelope of synthetic material. The envelope at the area of the lower and upper side of the Hall element contains recesses extending to the proximity of the semiconductor body in which poleshoes of a ferromagnetic material can be incorporated in order to concentrate the magnetic field at the Hall element.

3,667,001
SELECTION CIRCUIT

Stephane Marcel Clement Victor Simon, Brussels, and Henri Albert Juli Verhille, Borgerhout, both of Belgium, assignors to International Standard Electric Corporation

Filed Dec. 10, 1970, Ser. No. 96,754
Claims priority, application Netherlands, Dec. 31, 1969, 6919630
Int. Cl. H01h 47/22
U.S. Cl. 317—137 15 Claims



Selective transfer circuit using transistors and diodes. A time variable gating signal is applied to a coincidence gating

chain to trigger a selected transistor into conduction thereby activating an output device individual to the activated transistor. Isolating diodes are used to prevent cross activation of transistors.

3,667,002

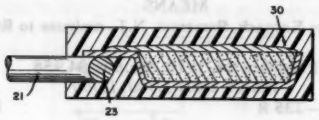
STRIP CONFIGURATION FOR CAPACITORS

Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Original application Apr. 19, 1968, Ser. No. 722,702, now Patent No. 3,530,342. Divided and this application June 1, 1970, Ser. No. 54,066

Int. Cl. H01g 9/05

U.S. Cl. 317—230 **10 Claims**



The present invention relates to a configuration which is an integral part of the anode structure of an electrolytic capacitor. A strip of film-forming metal includes at least one appendage which has formed therein a depression which serves as the retaining means for a bonded mass of film-forming metal. The appendage also includes a reduced neck portion. The appendage and the mass of film-forming metal have an oxide layer, a semiconductor layer and a conductive layer formed thereover. Terminal means includes one extremity having a bent end portion connected to the reduced neck portion and includes another extremity having a substantially flatten end portion connected to the conductive layer carried by the bonded mass of film-forming metal.

3,667,003

THREE VALLEY TRANSFERRED ELECTRON OSCILLATOR

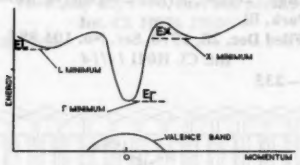
Cyril Hilsum, Malvern, and Huw David Rees, Malvern Link, both of England, assignors to Minister of Aviation Supply in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 21, 1971, Ser. No. 136,152

Claims priority, application Great Britain, Apr. 22, 1970, 19,350/70

Int. Cl. H01l 3/20, 5/00

U.S. Cl. 317—234 R **8 Claims**



A semiconductor device includes a piece of semiconductor material exhibiting transferred electron effects between three sets of conduction band valleys, which sets consist of a set of lowest energy, a set of highest energy and a set of intermediate energy, and in which the set of lowest energy has an energy density of states smaller than that of either of the other two sets and in which the rate at which electrons are scattered between the set of lowest energy and the set of intermediate energy is less than both the rate at which electrons are scattered between the set of lowest energy and the set of highest energy and the rate at which electrons are scattered between the set of intermediate energy and the set of highest energy, and means for applying voltages across the piece of semiconductor material, whereby electron transfer occurs between the different sets of valleys. Also included in the device are means for controlling the current flowing such that it is free of dipole domains. The semiconductor material may be either InP_xAs_{1-x} $(1 \geq x \geq 0.75)$ or $In_yGa_{1-y}Sb$ $(0.05 \leq y \leq 0.30)$.

3,667,004

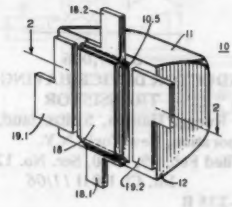
ELECTROLUMINESCENT SEMICONDUCTOR DISPLAY APPARATUS

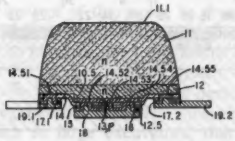
Matthew Kuhn, Warren Township, Somerset County, and Norman Edwin Schumaker, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 26, 1970, Ser. No. 84,049

Int. Cl. H01l 15/00

U.S. Cl. 317—234 R **10 Claims**





An electroluminescent semiconductor display comprises a plurality of electroluminescent semiconductor devices, which are electrically connected together in a rectangular random access type of beam lead array. Each electroluminescent device includes an N-type gallium phosphide semiconductor base member of one conductivity type having a mesa in which a P-N junction is located. A beam lead array parallel to the *x* direction contacts the P-type zone through apertures in a light reflecting coating on the plateau surface of each of the mesas, whereas a beam lead array parallel to the *y* direction contacts each of the N-type base regions in two separate portions thereof, thereby avoiding the need for any leads which are in the path of the emitted light. The shape and conductivity profile of the N-type zones in the base region and the plateau are tailored in order to serve as efficient electrical crossover conductors for the beam leads in the *y* direction as well as to reduce light absorption.

3,667,005

OHMIC CONTACTS FOR SEMICONDUCTORS DEVICES

James A. Cunningham, Richardson, and Coy D. Orr, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

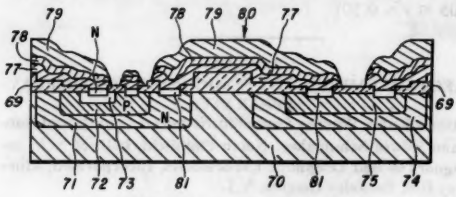
Original application June 30, 1966, Ser. No. 561,845, now Patent No. 3,616,401. Divided and this application Aug. 3, 1970, Ser. No. 67,654

Int. Cl. H01l 1/14

U.S. Cl. 317—234 R **7 Claims**

Disclosed are methods for depositing multilayer ohmic contacts upon a substrate of semiconductor material disposed within a low pressure chamber; such including for example the particular features of upward sputtering of the

various metal films, simultaneous sputtering of platinum with gold utilizing a sputtering cathode composed of platinum and gold, and adding hydrogen into an inert sputtering atmosphere to eliminate undesirable formation of oxides. This



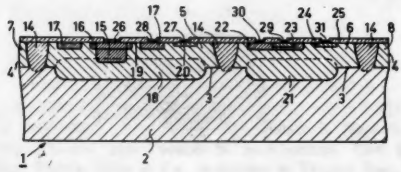
invention provides imporved adhesion of the sputtered metal films to the semiconductor surface and the silicon oxide, and provides the formation of the metal film which is substantially free of pin holes and which has substantially uniform resistivity.

3,667,006

SEMICONDUCTOR DEVICE HAVING A LATERAL TRANSISTOR

Heniz Walter Ruegg, Hausen, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,547
Int. Cl. H01l *11/06*
U.S. Cl. 317—235 R **5 Claims**



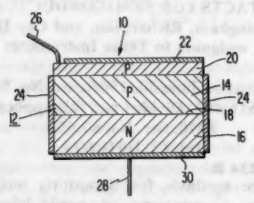
The invention relates to a semiconductor device having a substrate of the one conductivity type on which an epitaxial layer divided into islands of the opposite conductivity type is provided and in which at least one island comprises a lateral transistor and a buried layer of the opposite conductivity type. In order to obtain both a small vertical emitt.. injection and a high collector-base breakdown voltage, the emitter zone has a larger thickness than the collector zone and, in contrast with the collector zone, the emitter zone reaches up to the buried layer. No additional manufacturing step is necessary for the manufacture.

3,667,007

SEMICONDUCTOR ELECTRON EMITTER

Henry Kressel, Elizabeth, and Jacques Isaac Pankove, Princeton, both of N.J., assignors to RCA Corporation

Filed Feb. 25, 1970, Ser. No. 13,980
Int. Cl. H01l *15/00*
U.S. Cl. 317—235 R **5 Claims**



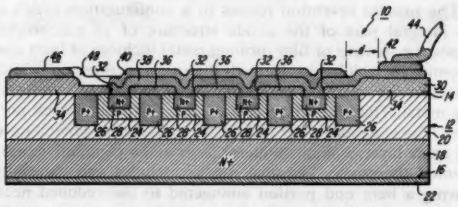
An electron emitter comprising a body of a semiconductor material which is adapted to generate light therein when properly biased but which is a poor absorber of the generated light. On a surface of the body is a thin region of a semiconductor material which is a good absorber of the generated light and which has an index of refraction which substantially matches the index of refraction of the material of the body. The thin semiconductor material region is adapted to absorb the light from the body and convert the light into free electrons. On the surface of the semiconductor material layer is a thin film of an electropositive work function reducing material which is adapted to emit the electrons formed in the semiconductor material layer.

3,667,008

SEMICONDUCTOR DEVICE EMPLOYING TWO-METAL CONTACT AND POLYCRYSTALLINE ISOLATION MEANS

Fredric Leroy Katnack, Somerset, N.J., assignor to RCA Corporation

Filed Oct. 24, 1970, Ser. No. 84,958
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **8 Claims**



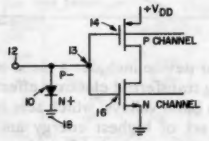
A device is formed in a semiconductor body having a major surface, with an insulating coating over the surface having an aperture exposing a portion thereof. A polycrystalline semiconductor layer is disposed in the aperture and over the coating, and a refractory metal layer overlies a portion of the semiconductor layer. A metal layer having low temperature properties overlies another portion of the semiconductor layer and is spaced from the refractory layer by a third portion of the semiconductor layer which provides metallurgical isolation and selective resistance between the two metal layers. Termination means contacts the low temperature layer.

3,667,009

COMPLEMENTARY METAL OXIDE SEMICONDUCTOR GATE PROTECTION DIODE

James M. Rugg, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 28, 1970, Ser. No. 101,885
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 **11 Claims**



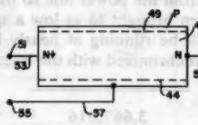
Gate protection is given to a complementary metal oxide semiconductor (CMOS) devices against excessive input voltage transients. An input diode which has a lower breakdown voltage than the gate oxide is attached to the input terminal to protect the gate oxide. The input protect diode is formed by diffusing an N+ region which overlaps both a P tube and an N substrate. The diffusion concentrations between the

various regions determine the breakdown voltage of the protection diode. The overlapping relationship of the N+ diffusion over the P− tub and N substrate creates a structure which prevents parasitic NPN action.

3,667,010
GUNN-TYPE SOLID-STATE DEVICES

Wilhelm Rindner, Lexington, and Harold Roth, Needham, both of Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 6, 1967, Ser. No. 651,627
Int. Cl. H01l *11/00*
U.S. Cl. 317—235R **4 Claims**

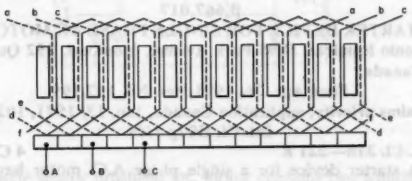


This invention is a multi-terminal Gunn-type semiconductor microwave generator capable of producing signals of stable frequency over a frequency range. In one form, a group III–V semiconductor chip having a varying cross-sectional area is mounted between a pair of contacts. The inner portion of the chip is appropriately doped to create a region of one type of conductivity and an outer shell portion of the chip is appropriately doped to create a region of opposite or different conductivity with a junction formed therebetween. A potential is applied across the pair of contacts to create an electric field gradient along the current axis of the device. A bias is applied through a third contact to the junction, which for the sake of discussion will be referred to as a P/N junction. The biased P/N junction creates a space-charge region that controls the length of the active region, whence the third terminal controls the frequency of the signal generated by the overall device. Numerous alternative embodiments of the invention are possible within the general concept of creating a biased junction that controls the length of the electric field gradient between the first and second contacts.

3,667,011
BRUSHLESS DC TORQUE MOTOR INCLUDING COMMUTATOR BARS FED FROM A PHOTO-COMMUTATION CIRCUIT

William M. Casaday, and Robert L. Fisher, both of Charlottesville, Va., assignors to Sperry Rand Corporation

Filed July 15, 1970, Ser. No. 54,989
Int. Cl. H02k *29/00*
U.S. Cl. 318—138 **3 Claims**

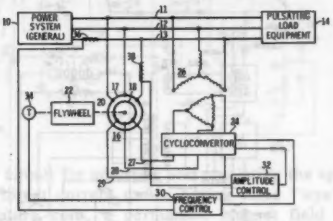


The stator of a brushless DC motor is formed from a DC armature of the type used in conventional brush-type motors. A permanent magnet rotor is rotatable about the axis of the armature and carrys an optical shutter that cooperates with a light source and a photosensor to provide switching signals. Commutating circuits, responsive to the switching signals, are permanently connected directly to commutator bars selected so that successive switching signals energize appropriate winding elements to maintain rotation of the rotor.

3,667,012
ELECTRICAL APPARATUS WITH FREQUENCY CONTROLLED LOAD COMPENSATION

Lee A. Kilgore, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 31, 1970, Ser. No. 59,949
Int. Cl. H02k *7/02*
U.S. Cl. 318—161 **4 Claims**

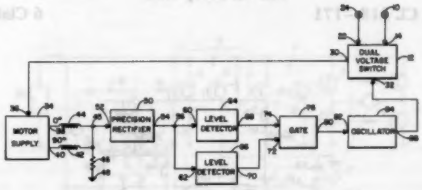


A wound rotor motor and a flywheel are provided on a shaft with speed control of the motor by frequency control on its secondary applied by means such as a cycloconverter that is responsive to pulsating load conditions on the system. Power flows from the flywheel into the system during periods of high load and into the flywheel during periods of low motoring load or a regenerative load. The invention permits use of equipment, such as large excavators, that have sharply varying loads in their duty cycles, in locations where there are small, otherwise inadequate, power systems.

3,667,013
HYSTERESIS MOTOR CONTROL CIRCUIT APPARATUS

Robert E. Bicking, Anoka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 25, 1970, Ser. No. 75,617
Int. Cl. H02k *19/08*; H02p *5/28*
U.S. Cl. 318—166 **4 Claims**



A power supply for use with hysteresis motors to provide a low power mode of operation. A current detector measures the level of current in hysteresis motor windings. The detector drives an oscillator which controls the voltage applied to the motor to maintain permanent magnetization of the rotor.

3,667,014

EXCITER ARRANGEMENT FOR SYNCHRONOUS MOTORS

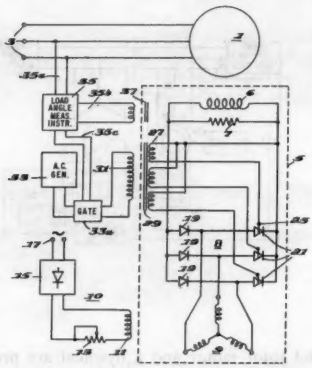
Wilfried Merhof, Baden, and Renato Noser, Ennetbaden, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Continuation of application Ser. No. 723,144, Apr. 22, 1968, now abandoned. This application Nov. 17, 1970, Ser. No. 90,431

Claims priority, application Switzerland, May 26, 1967, 7471/67

Int. Cl. H02p *1/46*

U.S. Cl. 318—167 3 Claims



An arrangement for controlling excitation of the field coil on the rotor of a synchronous motor during starting as well as during running at synchronous speed includes a rectifier bridge mounted on the rotor having controllable rectifiers in one bridge half and uncontrollable rectifiers in the other bridge half. The rectifier bridge is supplied with current from an exciter alternator also integrated into the rotor structure. During starting and up to near synchronous speeds the controllable rectifiers are blocked so as to block current flow from the motor field coil through the bridge. Thereafter, these rectifiers become unblocked and feed continuous current to the field coil.

3,667,015

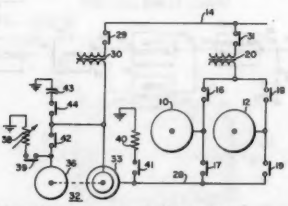
ALTERNATING CURRENT MOTOR STARTING APPARATUS AND METHOD

Gurney L. Godwin, Pittsburgh, and Lee A. Kilgore, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 18, 1970, Ser. No. 47,297

Int. Cl. H02p *1/52*

U.S. Cl. 318—171 6 Claims



A starting set including an induction machine and a synchronous machine is brought up to speed before connection to the main motor that is to be started. The induction machine may have a number of poles that is a fraction, such as one-half, of the poles of the synchronous machine of the starting set so that the secondary of the wound rotor motor produces a voltage at that fraction of the line frequency at full speed. Alternatively, the induction machine and the synchronous machine of the starting set may have the same or nearly the same number of poles but the machines are concatenated to provide the desired frequency change. After the starting set is up to full speed, the main motor is connected to the secondary of the wound rotor motor and accelerates to a speed near synchronism with the secondary supply. If the main motor is a synchronous machine it is then synchronized with the secondary supply by applying field excitation. Means are then provided to increase the load on the synchronous machine of the starting set. The starting set is then disconnected from the power line so that it will begin to decelerate and, when brought to as low a speed as possible, the main motor will be running at nearly line synchronous speed and can be synchronized with the line.

3,667,016

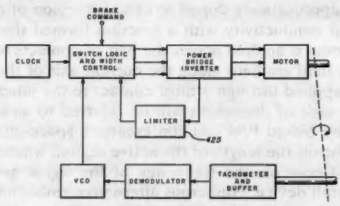
REGENERATIVE BRAKING CIRCUIT FOR INDUCTION MOTORS

John C. G. Dunfield, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 3, 1971, Ser. No. 139,477

Int. Cl. H02p *3/18*

U.S. Cl. 318—209 6 Claims



An induction motor is normally driven from a clock source acting through a power bridge inverter. Braking is accomplished by substituting a feedback signal for the clock signal. A tachometer in the feedback loop monitors the actual motor speed and cooperates to produce a feedback signal having a frequency characteristic that represents a predetermined fraction of the actual motor speed. When the feedback signal is applied to the motor through the power bridge inverter, the excitation frequency becomes and remains less than the frequency necessary to maintain the prevailing motor speed so that the motor operates in a negative slip mode in which it is quickly brought to a smooth stop.

3,667,017

STARTER DEVICE FOR SINGLE PHASE AC MOTORS

Antonio Ramirez, 5885 Park Avenue, Montreal, 152 Quebec, Canada

Filed Apr. 26, 1971, Ser. No. 137,199

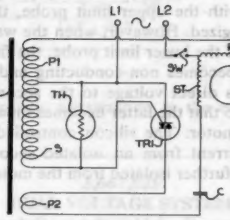
Claims priority, application Canada, Jan. 13, 1971, 102099

Int. Cl. H02p *1/44*

U.S. Cl. 318—221 E 4 Claims

A starter device for a single phase A.C. motor having a main winding and a starting winding adapted for connection to a single phase A.C. source. The starter device includes a semi-conductor switching device having a control electrode and a transconductive path, and a transformer having a first and a second primary windings arranged to generate opposite fluxes in the transformer core, and a secondary winding. The starter device includes a circuit for connecting the first primary winding in series with the main winding of the motor and another circuit for connecting the second primary wind-

ing in series with the transconductive path of the switching device and with the starting winding of the motor. The control electrode of the switching device is connected to the secondary winding of the transformer whereby the voltage induced in the secondary winding by the initial inrush of current flowing through the first primary winding upon starting of the motor will render the switching device conductive to



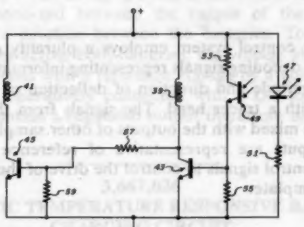
permit energization of the starting winding of the motor to start the same. The flux produced by the second primary winding shortly after initiation of conduction in the switching device will oppose the flux created by the first primary winding and so reduce the voltage induced in the secondary winding to stop conduction through the switching device and thus disconnect the starting winding of the motor.

3,667,018

BRUSHLESS DC MOTOR HAVING ELECTRONIC COMMUTATION RESPONSIVE TO ROTOR POSITION AND INDUCED ARMATURE WINDING VOLTAGE

Rodney G. Rakes, Bristol, Tenn., assignor to Sperry Rand Corporation

Filed Sept. 28, 1970, Ser. No. 76,113
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **4 Claims**



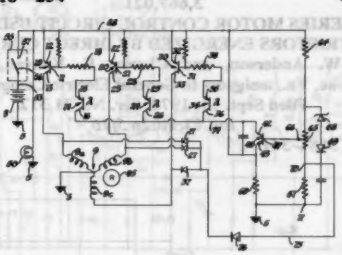
A single sensor brushless DC motor contains two windings that are alternately energized to sustain rotor rotation and includes transistor switches in series with each motor winding. The transistor in series with the first winding is driven directly from the sensor so as to energize the first winding when the sensor is illuminated and that transistor is driven into saturation. The transistor in series with the second winding has an input terminal coupled to the first motor winding so as to react to voltages induced in the first winding during times when the first winding is de-energized.

3,667,019

CONTROL CIRCUIT FOR ADJUSTING AND REGULATING THE SPEED OF A BRUSHLESS DIRECT CURRENT MOTOR RESPONSIVE TO VOLTAGES INDUCED IN THE ARMATURE WINDINGS

James O. Elliott, Xenia, and George W. Jackson, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1970, Ser. No. 79,729
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **4 Claims**



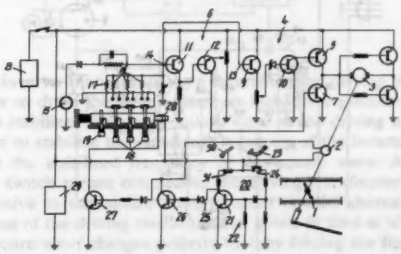
A control circuit for adjusting and regulating the speed of a brushless direct current motor having three "wye" connected armature coils, a permanent magnet field and a rotatable shaft. Each motor armature coil is connected in series with the collector-emitter electrodes of a respective switching transistor across a source of direct current supply potential, the base-emitter electrodes of each switching transistor being connected across the source of direct current supply potential through a respective photosensitive electrical switching device and the collector-emitter electrodes of a control transistor. A selectively variable magnitude of a direct current control potential is applied across the base-emitter electrodes of the control transistor and the photosensitive electrical switching devices are sequentially illuminated as the shaft rotates to sequentially establish the switching transistor base-emitter drive circuits. A direct current regulating potential generated in the motor armature coils as they are "cut" by the flux produced by the permanent magnet field is of a magnitude proportional to the speed of the motor and is applied in a reverse polarity relationship to the control potential for regulating the speed of the motor.

3,667,020

SPEED CONTROL APPARATUS FOR MOTORCAR ENGINE

Takaya Senzaki, Omiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 7, 1970, Ser. No. 52,928
Claims priority, application Japan, July 7, 1969, 44/53078
Int. Cl. H02p *1/40*
U.S. Cl. 318—297 **3 Claims**



An internal combustion engine of a vehicle is controlled in its speed of operation by an electric motor which is coupled to the throttle valve of the engine via an electromagnetic clutch. Speed selector devices regulate the introduction of

corresponding resistances into the motor supply circuit to control the degree of opening of the throttle valve, and upper and lower limit detection circuits effect operation of the motor to regulate engine speed within prescribed limits at a selected speed. A release circuit is operated by the vehicle brake to return the speed setting to engine idle while the clutch is temporarily opened and the release circuit is operated by the accelerator pedal to open the clutch and permit manual control of the engine speed.

3,667,021

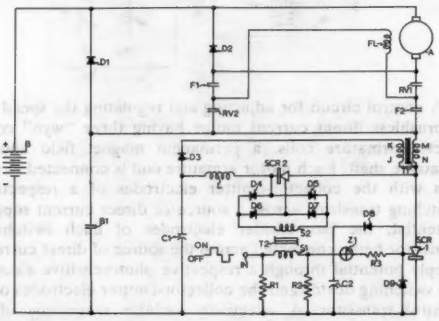
SERIES MOTOR CONTROL CIRCUIT USING THYRISTORS ENERGIZED BY DIRECT CURRENT

Albert W. Anderson, and Charles E. Konrad, both of Roanoke, Va., assignors to General Electric Company

Filed Sept. 11, 1970, Ser. No. 71,317

Int. Cl. H02p *5/16*

U.S. Cl. 318—341 **6 Claims**



A commutation control circuit for a motor including a power thyristor and an auxiliary thyristor for switching the power thyristor under control of a variable frequency pulse generator making use of a capacitor for commutation charged by a transformer, the charge on the capacitor being established to be ready for commutation whenever the power thyristor is gated, and the charging current being derived from a direct current source such as a lead/acid storage battery. The circuit specifically uses a positive pulse for causing conduction of the power thyristor and a negative pulse for switching the power thyristor "off."

3,667,022

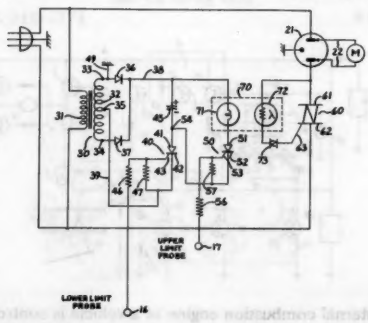
CONTROL FOR SUMP PUMP

James L. Quinn, 6143 West Touhy Avenue, Chicago, Ill.

Filed Sept. 2, 1970, Ser. No. 68,940

Int. Cl. G05b *13/00*

U.S. Cl. 318—482 **7 Claims**



A control for a motor driving a sump pump having lower and upper limit probes which includes first and second silicon controlled rectifiers having electrodes which are coupled to the respective probes. The anode-cathode circuit of the second silicon controlled rectifier includes a lamp having an associated photocell. The photocell is connected to the control electrode of a bilateral solid state switch, or triac, which is in series with the motor. The first silicon controlled rectifier is supplied with half-waves of a-c. so that it conducts when the lower limit probe is submerged, but is non-latching. Responsive to such conduction is a capacitor which applies direct voltage to the second silicon controlled rectifier so that the latter latches on when the upper probe becomes submerged. Thus when the water in the sump is pumped down, out of contact with the upper limit probe, the motor continues to be energized. However, when the water is pumped below the level of the lower limit probe, the first silicon controlled rectifier becomes non-conducting and the capacitor no longer applies direct voltage to the second silicon controlled rectifier so that the latter becomes unlatched, thereby turning off the motor. The silicon controlled rectifiers are supplied with current from an isolated secondary winding and the circuit is further isolated from the motor by lamp and photocell.

3,667,023

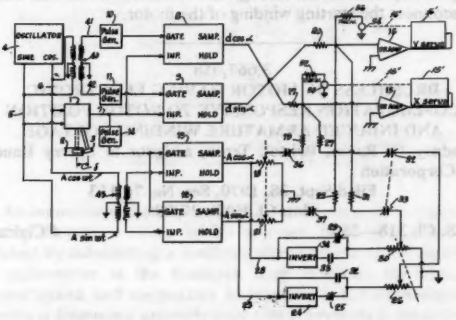
TRACER CONTROL SYSTEM

Marcel R. Sommeria, Palos Heights, Ill., assignor to Hyper-Loop, Inc., Summit, Ill.

Filed Mar. 30, 1970, Ser. No. 23,703

Int. Cl. G05b *19/36*

U.S. Cl. 318—578 **12 Claims**



A tracer control system employs a plurality of sampling devices for decoding signals representing information relating to the magnitude and direction of deflection of a stylus associated with a tracer head. The signals from the sampling devices are mixed with the outputs of other sampling devices, which outputs are representative of reference signals, to produce control signals to control the drive of the stylus relative to a template.

3,667,024

BIDIRECTIONAL SERVOMOTOR SYSTEM

Andrew F. Deming, Alliance, Ohio, assignor to The Alliance Manufacturing Company, Inc.

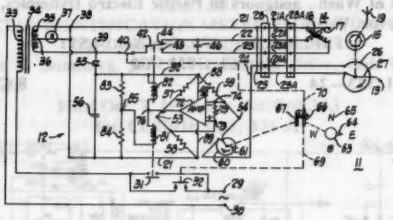
Filed Apr. 21, 1971, Ser. No. 135,852

Int. Cl. G05b *11/14*

U.S. Cl. 318—674 **20 Claims**

A servomotor system is disclosed which may be used for an antenna rotator or the like with a bidirectional AC motor controlled as to direction by a low voltage relay having double throw contacts. A DC bridge is energized from a rectifier and has an output to a differential amplifier which energizes a high voltage relay and a low voltage relay in selective conditions. For bridge output in a first direction of unbalance,

both relays are energized and for bridge output in the opposite direction of unbalance, only the high voltage relay is

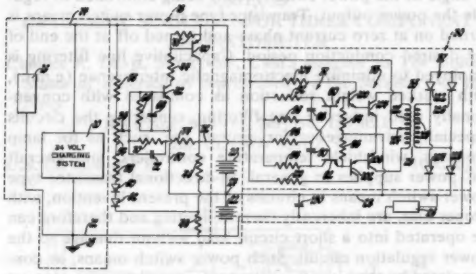


energized to provide energization to the entire servomotor system.

3,667,025
DUAL VOLTAGE SYSTEM

Robert W. Campbell, and Donald L. Cummins, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed June 21, 1971, Ser. No. 154,816
Int. Cl. H02j 7/14
U.S. Cl. 320—15 **4 Claims**



Two 12–volt batteries are connected in series across the output of a 24–volt charging system, and a DC to DC converter is connected between the output of the charging system and a junction between the batteries. To maintain equal voltages across both batteries, the voltage at the junction is compared with a reference voltage by a voltage regulator that is operatively connected with a DC to DC converter to maintain a regulated output therefrom to the junction.

3,667,026
AUTOMATIC TEMPERATURE RESPONSIVE BATTERY CHARGING CIRCUIT

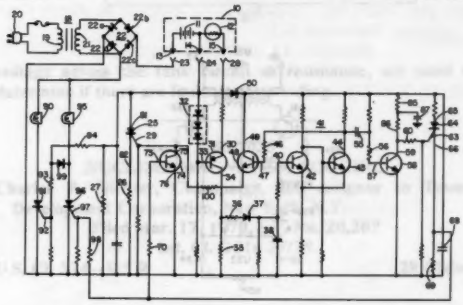
Henry A. Bogut, and Leon Jasinski, both of Chicago, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 2, 1970, Ser. No. 94,261
Int. Cl. H02j 7/04
U.S. Cl. 320—36 **16 Claims**

A charger for charging a battery at a first predetermined rate and automatically terminating said charge rate when the battery temperature rises, in response to the charging current, to a point indicating full charge. The battery has a thermistor mounted therein which changes resistance as the battery temperature changes.

The charger includes a charging circuit and silicon controlled rectifier in series with the battery. A sensing circuit, coupled to the thermistor, senses a thermistor resistance indicative of less than a full charge and changes from a first to a second state. If the thermistor resistance indicates a full charge, the sensing circuit changes from the second to the first state.

A switch circuit connected to the sensing circuit and the rectifier gate electrode is responsive to changes from the first to the second state to trigger the rectifier into conduction

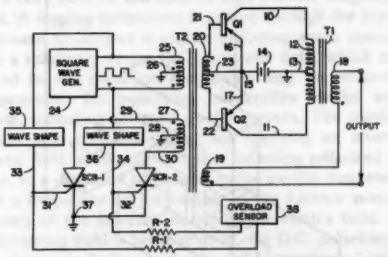


and allow charging of the battery at the predetermined rate. A latch circuit connected to the sensing circuit and rectifier gate electrode operates in response to the sensing circuit changing from the second to the first state to inhibit further conduction of the silicon controlled rectifier. The latch circuit is de-energized, allowing further conduction of the silicon controlled rectifier, by removal of the battery from the battery charger.

3,667,027
INVERTER CIRCUIT WITH STABILIZED FREQUENCY UNDER ALL LOAD CONDITIONS

Ricky Martin, Los Angeles, Calif., assignor to Bell Electronic Corp.

Filed Mar. 30, 1971, Ser. No. 129,477
Int. Cl. H02m 1/18
U.S. Cl. 321—11 **5 Claims**

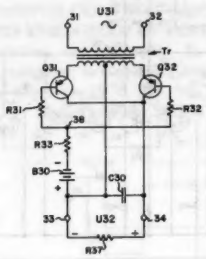


An inverter circuit utilizing a saturable core driving transformer to drive the switch elements includes a generator to pass a stabilized frequency square wave to the driving transformer to stabilize the switching frequency of the inverter to match the stabilized frequency of the square wave. Additional switch means coupled to the driving transformer are responsive to the square wave to short circuit, alternately, portions of the driving transformer at points in time at which the square wave changes polarity thereby forcing the flux to reverse and prevent any frequency drift should the feedback current from the output transformer of the inverter exceed the current supplied by the square wave signal. The additional switches also serve to hold the inverter in an off condition by turning both switches on simultaneously.

3,667,028
RECTIFIER CIRCUIT INCLUDING TRANSISTORS

Axel Leufgen, Muehlheim am Main, Germany, assignor to Dienes-Honeywell Holding GmbH, Muehlheim am Main, Germany

Filed Oct. 26, 1970, Ser. No. 83,917
Claims priority, application Germany, Nov. 18, 1969, P 19 57 786.7
Int. Cl. H02m 7/12
U.S. Cl. 321—47 5 Claims

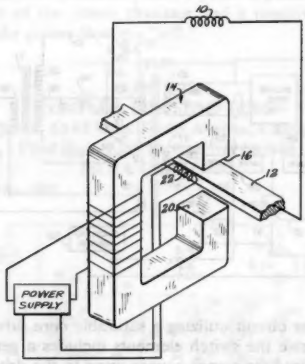


A rectifier circuit which uses transistors, is unaffected by changes in ambient temperature and frequency, and shows a linear relation between input AC and output DC. In the invention, the diode or diodes of a rectifier circuit are replaced by the emitter-collector path of a transistor (Q) and the base electrode of the transistor is connected to one of the output terminals 3 by means of a resistor R1 having a high resistance compared to the base input resistance of the transistor.

3,667,029
METHOD AND MEANS FOR CHARGING OR DISCHARGING SUPERCONDUCTING WINDINGS

Wilfried H. Bergmann, Leerfeldstr. 10, Munich 45, Germany

Filed Apr. 15, 1970, Ser. No. 28,893
Int. Cl. G05f 3/02
U.S. Cl. 323—8 10 Claims

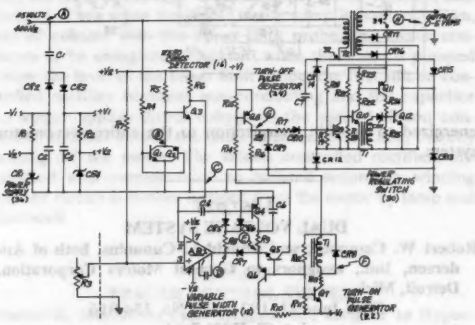


A winding of superconducting material is charged by electrically shorting the winding with a hard Type-II series superconducting material and cooling the winding and shorting material to a superconducting temperature. A magnetic flux is generated to penetrate the shorting material to establish therein fluxoids and a temperature gradient is established across the shorting material to cause motion of the fluxoids across the shorting material into the magnetic circuit of the winding to effect charging or discharging thereof.

3,667,030
AC-TO-AC POWER REGULATION CIRCUITS HAVING LOW E.M.I. AND SHORTED LOAD PROTECTION

David R. Gordon, Des Moines, and Gary L. Tarbox, Seattle, both of Wash., assignors to Pacific Electro Dynamics, Inc., Bellevue, Wash.

Filed Feb. 26, 1970, Ser. No. 14,511
Int. Cl. G05f 5/00
U.S. Cl. 323—24 8 Claims

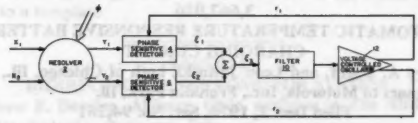


AC-to-AC power regulation circuits with power switch means in series with the line and load, the conduction period or angle of the power switch means being controlled to regulate the power output. Transistor type power switch means is turned on at zero current phase and turned off at the end of the desired conduction period. Capacitative line filtering is employed to minimize electromagnetic interference (e.m.i.), with marked weight reduction as compared with conventionally used inductive line filtering, rendering the circuits especially advantageous for aircraft use, such as for lamp dimmers, windshield temperature controllers, and aircraft AC power supplies in general. Bi-directional transistor type power switch means in circuits of the present invention, with proper bias, are inherently current-limiting and therefore can be operated into a short circuit load without damage to the power regulation circuit. Such power switch means, as contemplated by the invention, are power transistors, in contrast to conventionally used silicon controlled rectifiers (SCRs).

3,667,031
PHASE-LOCKED RESOLVER TRACKING SYSTEM

Duncan B. Cox, Jr., Manchester; Kenneth Fertig, Brookline, and Donald E. Fulton, Everett, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 18, 1970, Ser. No. 64,781
Int. Cl. H03d 1/00
U.S. Cl. 323—101 8 Claims



An improved phase-locked feedback loop which functions in conjunction with a resolver as an efficient and highly accurate tracking system for continually tracking the angle information in modulated resolver output waveforms. The improvement basically comprises a phase-locked loop incorporating as many phase-sensitive detectors as there are resolver outputs, each detector operating on one of the output windings of the resolver, the circuit being configured so as to provide resolver-angle to phase-angle conversion with

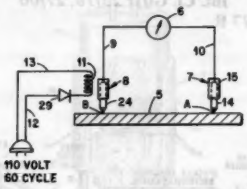
substantially increased accuracy and performance improvement.

3,667,032

METAL IDENTIFICATION METER EMPLOYING THE THERMOELECTRIC EFFECT

James E. Summers, Jr., 117 Columbia Drive, Oak Ridge, Tenn.

Filed Oct. 7, 1969, Ser. No. 864,363
Int. Cl. G01r 5/22; 324 32
U.S. Cl. 324—32 4 Claims



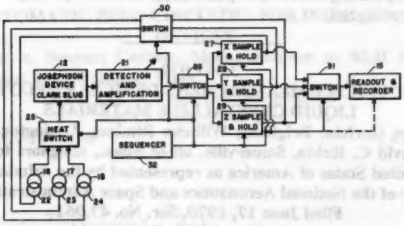
A metal comparator employing the thermoelectric effect of dissimilar metals joined in a circuit with a voltage indicator and employing two probes of identical metallic composition, one of the probes being heated to a temperature greater than ambient temperature.

3,667,033

CRYOGENIC SINGLE SENSOR THREE COMPONENT MAGNETOMETER

Charles R. Davis, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 6, 1971, Ser. No. 131,621
Int. Cl. G01r 33/02
U.S. Cl. 324—43 R 10 Claims



This invention relates to an improved magnetometer using sense loops of superconducting wire. A Josephson device is used to sense the induced current flowing in the wire and to control a bucking current to nullify the current flowing in the loop. The amount of current required to reduce the current to zero is used as a measure of the intensity of the magnetic field inducing the superconducting current flow. A system for sharing a single Josephson device in a plurality of sense loops is a component part of the system of the invention.

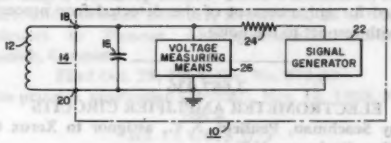
3,667,034

METHOD OF TESTING AN ELECTRICAL WINDING INCLUDING THE STEP OF CONNECTING THE WINDING TO PROVIDE A TANK CIRCUIT

John A. Freeze, South Boston, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 26, 1970, Ser. No. 50,152
Int. Cl. G01r 31/02, 31/06
U.S. Cl. 324—55 9 Claims

A non-destructive method of testing electrical windings, including the steps of providing a tank circuit using the winding to be tested as part of the tank circuit, and tuning the tank circuit to resonance. The resonant frequency, and maximum



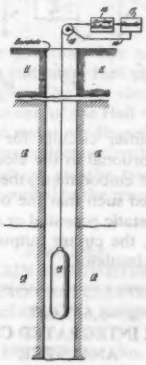
voltage across the tank circuit at resonance, are used to determine if there are faults in the winding.

3,667,035

NUCLEAR MAGNETISM LOGGING

Charles P. Slichter, Champaign, Ill., assignor to Texaco Development Corporation, New York, N.Y.

Filed Mar. 17, 1970, Ser. No. 20,207
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 28 Claims



Method and apparatus for analyzing earth materials in situ along a bore hole on the basis of their nuclear magnetic properties. A logging instrument is passed through the bore hole with means to subject a region including earth material in situ to a relatively strong D.C. magnetic field, which may be oriented in any direction and which may be relatively inhomogeneous, for polarizing susceptible nuclei in said material, including selected nuclei therein. The logging instrument also contains means for applying an alternating magnetic field to the same region, including polarized nuclei therein, in a direction transverse to the earth's magnetic field and at a frequency corresponding to the Larmor precession frequency of the selected nuclei in the earth's field. While the alternating field is being applied, the D.C. polarizing field in the region including said material is terminated within a predetermined time interval, i.e., turned off sufficiently slowly to provide an adiabatic variation of the D.C. field and sufficiently quickly to terminate the D.C. field within a time interval less than the characteristic thermal relaxation time of the selected nuclei. Since the frequency of the alternating field is such that it produces resonance in the earth's field alone, turning off the polarizing field sweeps the nuclei onto driven resonance. The alternating field is then abruptly terminated in said region including said polarized nuclei so that the selected polarized nuclei precess freely about the earth's relatively homogeneous magnetic field. A characteristic of the resulting free precession condition of the selected nuclei is detected. In accordance with a preferred embodiment, the free precession condition is detected by phase coherent detection utilizing a reference signal produced in timed correla-

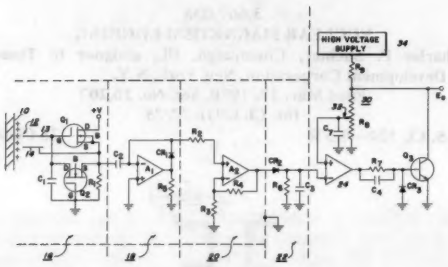
tion with the alternating field. Advantageously, in accordance with a further feature of the invention, computer of average transient signal averaging techniques, such as the type known as boxcar integration (digital or analogue), are employed for enhancement of the detected free precession signal with respect to the noise.

3,667,036

ELECTROMETER AMPLIFIER CIRCUITS

Ned Jay Seachman, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Jan. 23, 1970, Ser. No. 5,441
Int. Cl. G01r *27/00, 5/28, 1/30*
U.S. Cl. 324—72 **12 Claims**



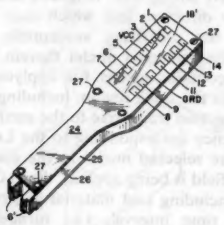
Electrometer amplifier circuits for producing a voltage signal which is proportional to the electrostatic potential on an insulator. In a first embodiment, the electrometer amplifier circuit is controlled such that the output voltage is equal to the sensed electrostatic potential or multiples thereof. In a second embodiment, the circuit output nulls about the surface potential on the insulator.

3,667,037

POCKET SIZE INTEGRATED CIRCUIT LOGIC ANALYZER

Eugene F. Kierce, Ballston Lake, N.Y., assignor to The General Electric Company

Filed Nov. 12, 1969, Ser. No. 875,997
Int. Cl. G01r *15/12, 19/14*
U.S. Cl. 324—73 R **9 Claims**



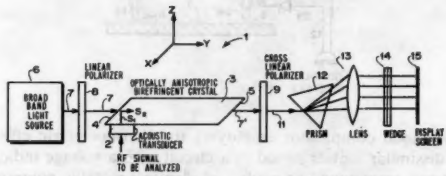
A method and apparatus employing a plurality of leads corresponding in number and respectively engaging the leads of a flat pack to be tested as it is functioning under power in circuit, wherein a plurality of flat pack function indicating lights are powered by a plurality of flat pack lamp drivers that receive their power from the power input of the flat pack to be tested and receive their operating signals from the remaining leads of the flat pack to be tested. The entire unit is compact and may be clipped in the pocket of an operator. The input leads are cantilevered springs biased away from corresponding slots within a housing head that fits over the flat pack to be tested. The power for driving the analyzer is received solely from the circuit board containing therein the flat pack to be tested and the lamp drivers assure that there will be no material alteration in the flat pack to be tested as it operates in circuit.

3,667,038

ACOUSTO-OPTIC RF SPECTRUM ANALYSIS METHOD AND APPARATUS

Leonard S. Cutler, and Donald L. Hammond, both of Los Altos Hills, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 17, 1970, Ser. No. 46,910
Int. Cl. G01r *23/16, 27/06*
U.S. Cl. 324—77 R **8 Claims**



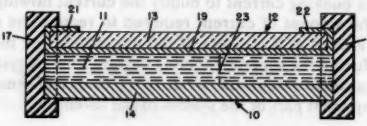
An acousto-optic RF spectrum analysis method and apparatus is disclosed wherein radio frequency energy to be spectrum analyzed is employed to excite an acoustic wave in an optically anisotropic medium. A linearly polarized white light beam is collinearly diffracted on the acoustic wave in the anisotropic medium to diffract light of the first polarization and of a frequency related to the frequency of the acoustic wave into light of the second polarization. The diffracted output light is then analyzed to separate light of the first polarization from light of the second polarization. The separated light is spectrum analyzed to obtain a spectrum corresponding to the spectrum of the radio frequency energy to be analyzed.

3,667,039

ELECTRICITY MEASUREMENT DEVICES EMPLOYING LIQUID CRYSTALLINE MATERIALS

Andre Garfein, Brighton; Wilhelm Rindner, Lexington, and David C. Rubin, Somerville, all of Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed June 17, 1970, Ser. No. 47,061
Int. Cl. G01r *27/22;* **G08b** *23/00*
U.S. Cl. 324—92 **7 Claims**



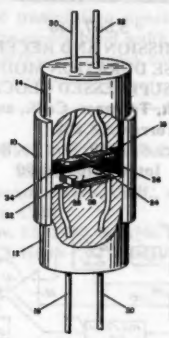
Disclosed are measuring instruments utilizing liquid crystalline elements that exhibit visible change in response to input signals above given threshold levels. By applying the input signals non-uniformly so that the threshold value is exceeded in only certain portions of the liquid crystalline element, visible discontinuities are created therein. The locations of these discontinuities are made dependent on the magnitudes of the input signals, direct readouts of which are provided by suitably calibrated indicia.

3,667,040

SENSOR FOR DETECTING RADIO FREQUENCY CURRENTS IN CARBON BRIDGE DETONATOR

Abraham Grinoch, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 28, 1970, Ser. No. 76,124
Int. Cl. G01r 5/26, 21/04
U.S. Cl. 324—106 2 Claims



This invention relates to an improved apparatus for monitoring induced electromagnetic current in carbon bridge detonators. A heat detecting means is held in close proximity to a chip bridge resistor, which simulates the carbon bridge in a carbon bridge detonator, to measure the heat radiated therefrom.

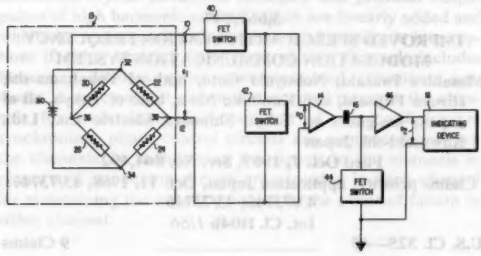
The invention described herein may be manufactured, used and licensed by or for the Government for governmental purposes without the payment to me of any royalty thereon.

3,667,041

AUTOMATIC ZERO CIRCUITRY FOR INDICATING DEVICES

Donald A. Senour, Carlisle, Mass., assignor to BLH Electronics, Inc., Waltham, Mass.

Filed Dec. 4, 1969, Ser. No. 882,000
Int. Cl. G01r 1/02, 1/30
U.S. Cl. 324—130 1 Claim



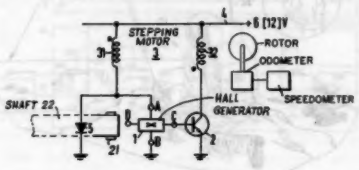
Automatic zero circuitry for low-level signal indicating devices is provided which includes a capacitor at the output of an amplifier for storing a charge, during a given period of time, equal to the drift or offset voltage of the amplifier such that during a measuring period of time, the indicating device will give a true and correct reading. A dual slope integrator in combination with a plurality of field-effect-transistors enables the proper time periods for the storing and reading operations described above.

3,667,042

CIRCUIT ARRANGEMENT FOR REMOTE INDICATION OF THE ROTARY MOVEMENT OF A SHAFT

Walter Engel, Nurnberg-Eibach; Dieter Flachsbarth, Ruckersdorf, and Hermann Schwarz, Henfenfeld, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 28, 1969, Ser. No. 871,897
Claims priority, application Germany, Nov. 14, 1968, P 18 08 768.8
Int. Cl. G01p 3/54
U.S. Cl. 324—174 2 Claims



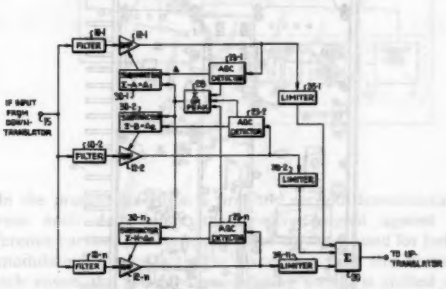
An electronic pulse generator has a permanent magnet driven by a shaft and a stationary Hall generator in operative proximity with the magnet. The base electrode of a transistor is directly connected to one of the Hall voltage electrodes of the Hall generator. The stator winding of a stepping motor is connected to the emitter-collector circuit of the transistor, is driven by the Hall voltage via the transistor, and in turn drives a speedometer coupled to the transistor.

3,667,043

CONSTANT GAIN BANDWIDTH PRODUCT COMMUNICATION SATELLITE REPEATER

James D. Ahlgren, McLean, Va., assignor to Telcom, Inc., McLean, Va.

Filed Sept. 19, 1969, Ser. No. 859,282
Int. Cl. H04b 7/20
U.S. Cl. 325—3 10 Claims



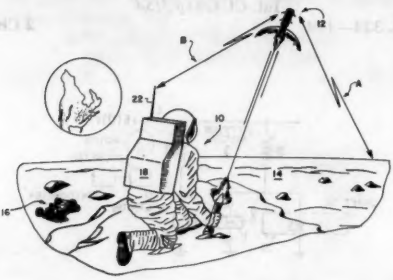
A transponder is rendered capable of automatically adjusting its bandwidth to accommodate the applied input signal. The input signal is applied in parallel to a plurality of signal channels which include filters of differing bandwidths and amplifiers having nominal gains arranged such that the product of amplifier gain and filter bandwidth is the same for all channels. The signal levels from all channels are compared and that channel providing the signal of highest level is permitted to transmit and the others are inhibited. Inhibition of channels may take the form of automatic gain control of the channel amplifiers or selective gating by means of appropriate logic circuitry.

3,667,044

EMERGENCY LUNAR COMMUNICATIONS SYSTEM

Otha H. Vaughan, Huntsville, and Lee B. Malone, Athens, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 3, 1970, Ser. No. 86,417
Int. Cl. H04b 7/14
U.S. Cl. 325—4 5 Claims



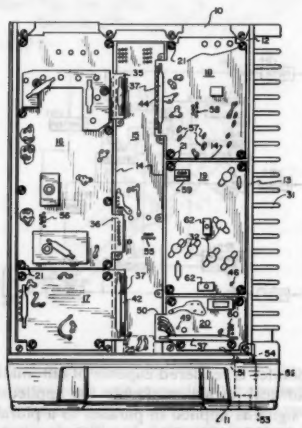
A communication system for emergency use on the moon that includes three transceivers. One of the transceivers is carried by an astronaut and another is positioned at a basecamp. The system also includes a hand held launcher and rocket vehicle that is utilized by the astronaut to launch a third relay transceiver in an upward trajectory above the lunar surface. The relay transceiver is mounted in the rocket vehicle and functions to relay voice communications between the two transceivers located on the lunar surface.

3,667,045

CHASSIS AND MONITORING ARRANGEMENT FOR ELECTRICAL APPARATUS

Jimmy Paul Combs, Palatine, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 25, 1970, Ser. No. 49,699
Int. Cl. H04b 1/38
U.S. Cl. 325—15 11 Claims



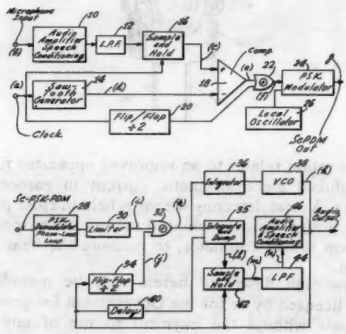
Electrical apparatus including components on plurality of chassis boards each having conductors thereon forming electrical circuits. The boards may be secured in cooperative relationships on a frame or housing structure, with the boards having portions in overlying relation with disengageable connecting means for interconnecting the circuits on the boards. The electrical equipment may be a mobile radio receiver and transmitter, with one board being a control board and the other boards coupled thereto having the radio receiver and radio transmitter components thereon. The control board has a connector thereon for making external connections to the circuit thereof, which is interconnected to the circuits on the receiver and transmitter boards. The control, receiver and transmitter boards are accessible for servicing, and have sockets for receiving a control plug and a test plug from a test set for monitoring the signals in the circuits. The individual chassis boards can be replaced without removing the housing from the vehicle in which it is installed.

3,667,046

VOICE TRANSMISSION AND RECEIVING SYSTEM EMPLOYING PULSE DURATION MODULATIONS WITH A SUPPRESSED CLOCK

Ralph W. Schoolcraft, Torrance, Calif., assignor to The Magnavox Company, Torrance, Calif.

Filed Oct. 9, 1969, Ser. No. 865,145
Int. Cl. H04b 1/00
U.S. Cl. 325—38 16 Claims



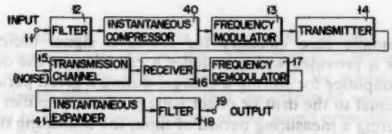
A voice transmission system including coded voice information using pulse duration modulation (PDM) with a suppressed clock and wherein this suppressed clock pulse duration modulated voice signal is used to modulate a phase shift keying modulator (PSK). The receiver includes a phase shift keying demodulator which feeds a limiter having a wide bandwidth so as to achieve the highest possible processing gain. The receiver also includes a voltage controlled oscillator which is fed an error signal derived from an integrator so as to produce an output signal from the voltage controlled oscillator to replace the suppressed clock.

3,667,047

IMPROVED SPEECH ARTICULATION FREQUENCY MODULATION COMMUNICATION SYSTEM

Masahiro Iwasaki; Nobuyuki Goto, both of Yokohama-shi; Hiroya Fujisaki, and Kunihiko Niwa, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Oct. 7, 1969, Ser. No. 864,492
Claims priority, application Japan, Oct. 11, 1968, 43/73744; 43/73745; 43/73746
Int. Cl. H04b 1/66
U.S. Cl. 325—45 9 Claims



The present invention provides a frequency modulation communication system wherein there is disposed in the trans-

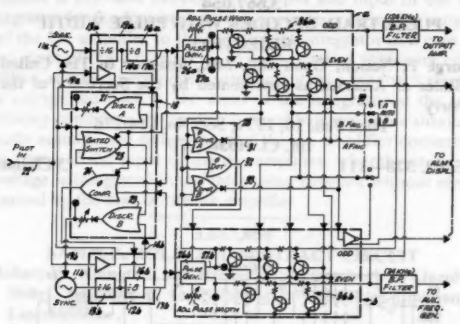
mitting side a first filter capable of furnishing transmission signals with such frequency characteristics of the voiced and unvoiced speech signal components as to allow information to be transmitted at the maximum rate possible with said transmission signals as well as with the transmission channel used and in the receiving side a second filter capable of bringing the frequency characteristics of signals received and frequency demodulated there back to the original state when said received signals were initially transmitted, thereby enabling the articulation of transmission signals to be improved with the said transmission channel, or enabling the same articulation of transmission signals to be maintained with a compressed frequency band width of the transmission channel and the prescribed frequency bandwidth to be compressed without any inconvenience.

3,667,048

CARRIER SUPPLY WITH SYNCHRONOUS REDUNDANCY

Kjell T. Hansen, Mountain View, Calif., assignor to Farinon Electric, San Carlos, Calif.

Filed Nov. 13, 1970, Ser. No. 89,240
Int. Cl. H04b 1/02; H04j 1/06
U.S. Cl. 325—157 **14 Claims**



A redundant carrier supply which includes a pair of parallel channels each of which receives a base frequency from an associated crystal controlled oscillator and provides output pulses of high harmonic content which are linearly added and which are maintained without phase and amplitude interruptions if either channel fails. Each of said channels includes frequency dividers, pulse generators and attenuator networks. A sync control circuit is connected between the channels for maintaining the operation of the oscillators in synchronism, phase control circuits are connected between the channels for maintaining the signals in the channels in phase, and attenuator circuits are provided in each channel for maintaining the output constant in the event of failure in either channel.

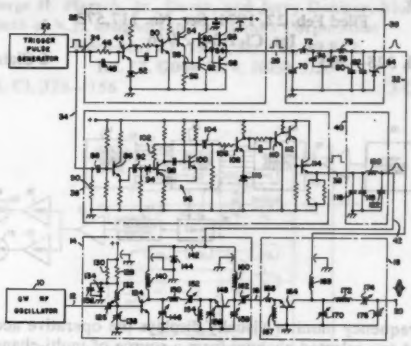
3,667,049

RADIO FREQUENCY PULSE TRANSMITTER

Nathaniel S. Ostroff, Perkasie, and Willie Rose, North Wales, both of Pa., assignors to Acrodyne Industries, Incorporated, Willow Grove, Pa.

Filed Oct. 30, 1970, Ser. No. 85,566
Int. Cl. H03k 7/00; H04b 1/04
U.S. Cl. 325—164 **11 Claims**

In a pulse transmitter for airborne distance measuring equipment, the final stage of a two-stage RF amplifier is modulated by a primary modulating pulse having a gradual rise and decay, and the drive stage is modulated by a secondary modulating pulse which envelopes the primary modulating pulse in time so that the final stage has adequate drive before the primary modulating pulse occurs.

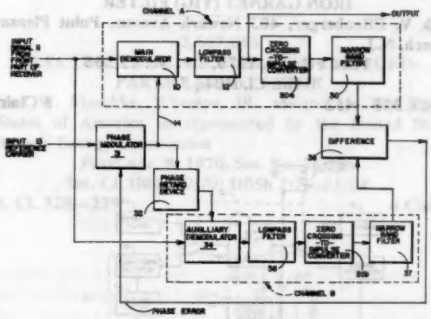


3,667,050

COARSE CARRIER PHASE CORRECTION SYSTEM

Earl D. Gibson, Huntington Beach, Calif., assignor to North American Rockwell Corporation

Filed Nov. 27, 1970, Ser. No. 97,422
Int. Cl. H04b 1/26
U.S. Cl. 325—323 **8 Claims**



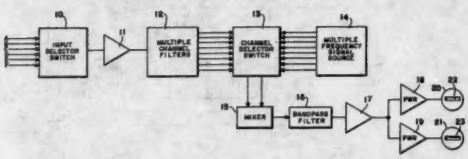
In the present invention a first and second demodulating means each demodulate the received signal against a reference carrier. The same reference carrier is used for both demodulating means with the exception that the carrier which enters the second demodulating means is shifted in phase by a small fixed amount. The two demodulated signals are then fed to independent zero-crossing detector means, which detector means provide output signals proportional to the phase difference between the reference carrier signal used with each of the associated demodulators and the desired (correct) carrier signal.

A difference means senses the output signals from each of the zero-crossing detectors to provide an error signal proportional to the phase difference between the two output signals. The error signal is then utilized by a phase modulator to control the phase of the reference carrier signal which is fed to the first and second demodulators to minimize the phase difference between the reference carrier and the desired carrier signal.

3,667,051
MULTI-CHANNEL FREQUENCY MONITOR

Glidden J. Barstow, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 22, 1971, Ser. No. 117,573
Int. Cl. H04l 27/16
U.S. Cl. 325—363 6 Claims

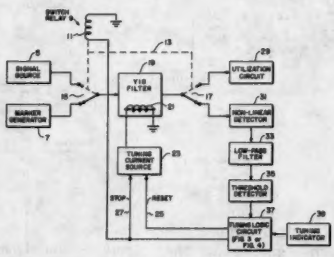


A frequency monitor visually displays the operative accuracy of any selected channel from a source of multi-channel signals. The accuracy of operation of upper and lower frequency sidebands defining each selected channel is visually displayed on vibrating reed meters which are preferably coded visually in color and/or shape so as to render the display immediately indicative of whether the selected channel is functioning within predetermined tolerances. Such a visual display renders the desired indication of the degree of operative accuracy without the requirement for specially trained personnel, interpretative decisions, or the manipulation of relatively complex instrumentation such as a frequency analyzer.

3,667,052
CIRCUIT FOR ACCURATE TUNING OF A YITTRIUM IRON GARNET (YIG) FILTER

Frank V. Effenberger, 403 Newark Avenue, Point Pleasant Beach, N.J.

Filed Feb. 20, 1970, Ser. No. 13,265
Int. Cl. H04q 3/18
U.S. Cl. 325—452 5 Claims

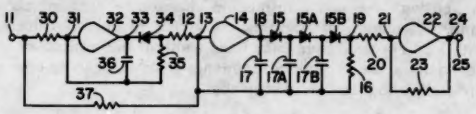


The magnetically tuned broadband YIG filter characterized by a predetermined passband at its half power points has a plurality of marker frequencies spaced apart by the width of the passband applied to its input while the magnetic tuning flux is varied in programmed fashion. Detector circuitry connected to the filter output produces a beat frequency equal to the frequency span of the passband each time the filter's half power points are brought into coincidence with a pair of the marker frequencies. A programmed tuning logic circuit keeps track of the number of coincidences of the half power points and successive marker frequency pairs tuned through and automatically halts the flux variation when the filter is tuned to the programmed marker frequency pair. The tuning circuitry can be disconnected after the tuning operation.

3,667,053
DIODE LAG CIRCUIT

Francis G. Shinskey, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed June 7, 1967, Ser. No. 644,219
Int. Cl. H03k 5/159
U.S. Cl. 328—55 4 Claims

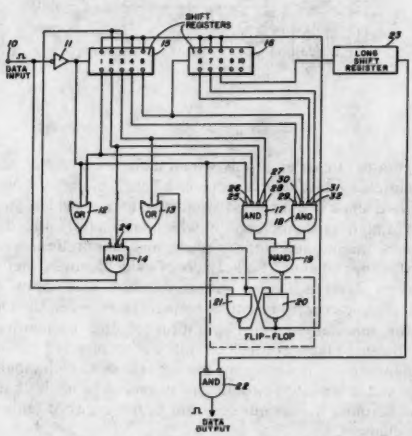


It is found that the voltage drop across a diode is approximately proportional to the logarithm of the current therethrough; this relationship may be employed to generate a variable time constant lag when incorporated in the feedback circuit of a simple amplifier; distributed lags may be generated by employing a series of diodes in the feedback circuit.

3,667,054
PULSE TRAIN DECODER WITH PULSE WIDTH REJECTION

George P. Nelson, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 10, 1971, Ser. No. 114,276
Int. Cl. H03k 5/20
U.S. Cl. 328—111 3 Claims



Logic circuitry to decode a series of pulses in an IFF system. Decoding is accomplished by sensing the presence of multiple pulses in a distinct time relationship with each other and excluding those pulse trains in which the individual pulses do not have the correct time relationship. The width of the individual pulses is also used as a decoding criteria and if a particular pulse does not have the correct width by being either too narrow or too wide, it is not considered for time position decoding.

3,667,055

INTEGRATING NETWORK USING AT LEAST ONE D-C AMPLIFIER

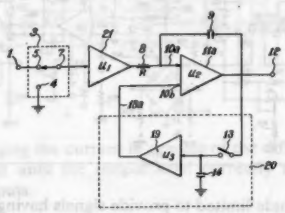
Kozo Uchida, Tokyo-to, Japan, assignor to Iwasaki Tsushinki Kabushiki, a/k/a Iwatsu Electric Co., Ltd., Tokyo-to, Japan

Filed June 24, 1970, Ser. No. 49,294

Claims priority, application Japan, June 28, 1969, 44/51173; 44/51174; May 13, 1970, 45/40037; 45/40038; 45/40039; 45/40040

Int. Cl. H03k 5/00

U.S. Cl. 328—127 19 Claims



An integrating network for performing integration of an input voltage by the use of an integrator comprising time-constant means and a d-c amplifier, wherein a drift memory circuit is provided between the output and input of the integrator for feeding back in the opposite polarity the output of the d-c amplifier to the input of the integrator in a case of no input of the d-c amplifier so as to obtain a stationary condition and for continuously sending out, as a feedback signal, a voltage fed back to the input of the integrator at the stationary condition, the feedback signal having a value substantially equal to the drift voltage of the d-c amplifier converted in terms of the input of the d-c amplifier, whereby an input voltage is integrated in the integrating network without error caused by the drift of the d-c amplifier.

3,667,056

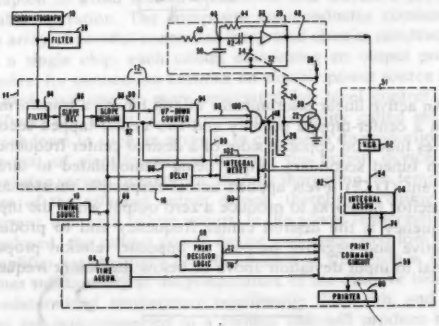
SAMPLE, HOLD, AND SUBTRACT CIRCUIT

Robert W. Allington, and Herbert C. Griess, both of Lincoln, Nebr., assignors to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Nov. 17, 1970, Ser. No. 90,249

Int. Cl. H03k 17/16

U.S. Cl. 328—151 11 Claims



To correct the drifting baseline of a chromatographic signal, a sampling, holding, and subtracting circuit of a baseline correction apparatus samples the signals during clock pulses from a timing source and stores the values of the signals across a capacitor. When a slope detector in the baseline correction circuit senses that the slope of the signal starts to deviate from the baseline and form a peak, the sample, hold and subtract circuit stops sampling and storing new values and subtracts the last stored value from the signal.

3,667,057

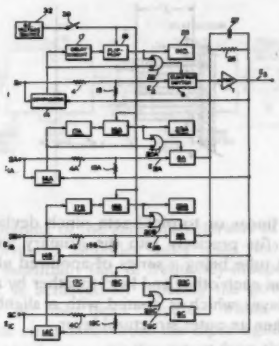
METHOD AND MEANS FOR PROVIDING AN OUTPUT CORRESPONDING TO THE AVERAGE OF ACCEPTABLE INPUT SIGNALS

George H. Pfersch, Jr., Dover, and Jerry Doniger, Montvale, both of N.J., assignors to The Bendix Corporation

Filed May 22, 1970, Ser. No. 39,817

Int. Cl. G06g 7/14; H03k 5/20

U.S. Cl. 328—156 3 Claims



A circuit has averaging means for providing an output corresponding to the average acceptable input signals, a comparator for comparing each input signal to the average output, and switching means controlled by the comparator for eliminating unacceptable input signal from the average when the signals differ a predetermined amount from the average output.

3,667,058

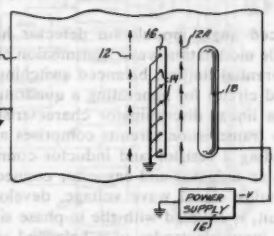
ELECTROSTATIC ACCELERATED-CHARGED-PARTICLE DEFLECTOR

Alfred W. Maschke, Wheaton, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 8, 1970, Ser. No. 26,576

Int. Cl. H01j 29/70; H05h 7/10, 13/04

U.S. Cl. 328—229 4 Claims



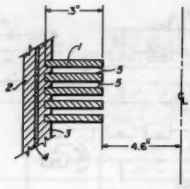
An electrostatic accelerated-charged-particle deflector includes a first electrode and a plurality of wire second electrodes spatially mounted with respect to each other and the first electrode to permit the passage of the accelerated charged particles between the first electrode and the second electrodes. A power supply is connected to establish a voltage gradient between the first electrode and the wire electrodes normal to the direction of motion of the charged particles to interact therewith and deflect the charged particles. The potential gradient is established with the wire second electrodes being electrically positive in potential relative the first electrode.

3,667,059

ALL-METAL DISCHARGE TUBE

James A. Phillips; Aldred E. Schofield, and William L. Briscoe, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 9, 1971, Ser. No. 122,401
Int. Cl. H05h 1/02
U.S. Cl. 328—233 6 Claims



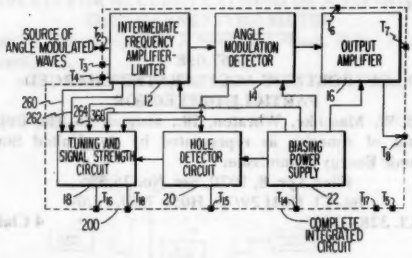
In a fast linear or toroidal zeta pinch device a discharge tube which fits precisely into the primary winding of said device, said tube being a series of anodized aluminum rings stacked upon each other and held together by a nonconducting epoxy layer which is coated with a slightly conducting layer, and then an outer structural layer.

3,667,060

BALANCED ANGLE MODULATION DETECTOR

Jack Avins, Princeton, N.J., assignor to RCA Corporation

Filed Aug. 26, 1970, Ser. No. 66,945
Int. Cl. H03d 3/02
U.S. Cl. 329—103 13 Claims



A balanced angle modulation detector having first and second angle modulation wave transmission circuits comprising; a differential limiter, balanced switching means, and a single tuned circuit for generating a quadrature signal wave such that a linear discriminator characteristic is obtained. One of the transmission circuits comprises a phase lag network including a resistor and inductor connected in series coupled to an inductor and capacitor connected in parallel. The quadrature signal wave voltage, developed across the tuned circuit, is coupled with the in-phase signal wave voltage to the input electrodes of a balanced switching device whereby the modulating signal information is recovered from the angle modulated wave.

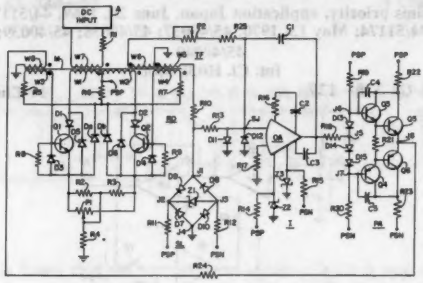
3,667,061

BIDIRECTIONAL DC SIGNAL DETECTOR WITH TRANSFORMER ISOLATION

John A. Riley, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 16, 1970, Ser. No. 55,316
Int. Cl. H03k 9/08
U.S. Cl. 329—104 9 Claims

A system for detecting a direct current (DC) signal in magnitude and direction, when electrical isolation is required between the DC signal being detected and the stage producing the output signal, employing an oscillator whose mark and space time durations are modulated according to the magnitude and direction of the DC signal being detected and wherein the so-modulated output of the oscillator is symmetrically amplitude limited to provide signals having a DC component corresponding to the DC signals being detected and the DC components are extracted to provide an output indication of the magnitude and direction of the DC signal being detected.

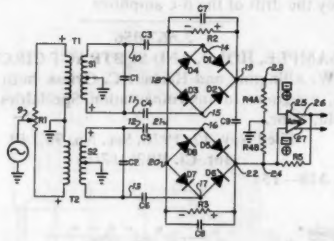


3,667,062

ACTIVE LINEAR DISCRIMINATOR CIRCUIT

Gary O. White, 7503 Cedar Hollow Drive, Louisville, Ky.

Filed Mar. 30, 1971, Ser. No. 129,494
Int. Cl. H03d 3/26
U.S. Cl. 329—142 7 Claims



An active linear discriminator circuit having a transformer with a center-tapped primary and two center-tapped secondaries tuned on opposite sides of a desired center frequency, each tuned secondary output being demodulated to direct current (D.C.) levels applied across respective resistor and capacitor networks to produce a zero output when the input frequency is the desired center frequency and to produce positive and negative outputs in opposite relation proportional to input deviation above or below the center frequency.

3,667,063

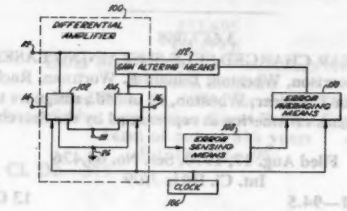
DIFFERENTIAL AMPLIFIER CIRCUIT

William Richard Boyd, Lafayette, and Robert C. Franklin, Los Gatos, both of Calif., assignors to Beckman Instruments, Inc.

Filed Apr. 27, 1970, Ser. No. 32,147
Int. Cl. H03f 19/00
U.S. Cl. 330—2 16 Claims

An electronic circuit for balancing a differential amplifier by periodically equalizing the inputs of the amplifier and

monitoring the output of the amplifier with equalized inputs. The output of the amplifier is then used to balance the amplifier by changing the current in one leg of the differential amplifier circuit until the output level correctly indicates the equalized inputs.

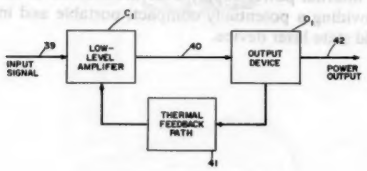


3,667,064

POWER SEMICONDUCTOR DEVICE WITH NEGATIVE THERMAL FEEDBACK

Richard D. Thornton, Concord, and John M. Borky, Hull, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 19, 1969, Ser. No. 825,491
Int. Cl. H03f *3/14*
U.S. Cl. 330—23 **14 Claims**



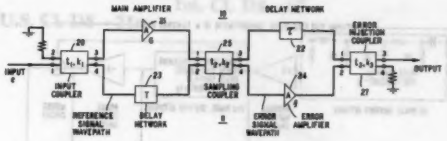
A composite power semiconductor is disclosed which is adapted to avoid second breakdown and therefore provide stable operation. The composite semiconductor consists of an array of parallel-connected integrated circuits constructed in a single chip, each circuit comprising an output power device, for connection between an electric power source and a load, and one or more associated low-level control amplifiers. The effect of the thermal instability called second breakdown in such an array is to channel a disproportionate amount of electric current through the output device undergoing second breakdown, thereby increasing the temperature of the affected output device, thereby increasing the current, etc. until failure occurs. In the power semiconductor disclosed, the output power device and associated low-level amplifier are thermally closely coupled so that each is at all times substantially at the temperature of the other or bears a predetermined temperature relationship therewith, and the two are interconnected in a fashion that will produce high electrical gain. There is negative thermal feedback so that a change in power dissipation with resulting temperature change in the output device causes the low-level amplifier to alter the electric current carried by the output device. For example, an increase in temperature which will tend to cause the output device to conduct a larger amount of electric current and which will also tend to cause the low-level amplifier to conduct a larger amount of current, can have the result, because of the close thermal coupling and interconnection, of maintaining the output current substantially constant.

3,667,065

FEED-FORWARD AMPLIFIER HAVING ARBITRARY GAIN-FREQUENCY CHARACTERISTIC

Henry Richard Beurrier, Chester Township, Morris County, and Harold Seidel, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 4, 1970, Ser. No. 69,757
Int. Cl. H03f *3/68*
U.S. Cl. 330—124 R **4 Claims**



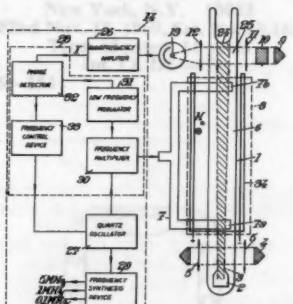
Frequency-shaping of the gain characteristic of a feed-forward, error-corrected amplifier using main and error amplifiers having essentially flat, or frequency-independent gain characteristics, is achieved by tapering the power division characteristics of: the input coupler, which extracts a reference signal component from the input signal; the sampling coupler, which compares the output from the main amplifier with the reference signal to form an error signal; and the error injection coupler, which injects the error signal into the main signal path. In a second embodiment of the invention, the band-shaping burden is shared between the amplifiers and the couplers.

3,667,066

OPTICALLY PUMPED ALKALI ATOMIC BEAM FREQUENCY STANDARD

Alfred Kastler; Maurice Arditi, both of Paris, and Pierre Cerez, Antony, all of France, assignors to Agence Nationale De Valorisation De La Recherche (Anvar),, Puteaux, France

Filed July 7, 1969, Ser. No. 840,139
Claims priority, application France, July 8, 1968, 158241
Int. Cl. H01s *1/06;* **H03b** *3/12*
U.S. Cl. 331—3 **9 Claims**



The frequency standard comprises an oven producing a beam of Rb^{85} and Rb^{87}, a lamp using Rb^{85} for enriching the level $F = 1$ of the fundamental state of the atoms of Rb^{87}, a hyperfrequency cavity equalizing the population of the levels $F = 1$, $m_F = 0$ and $F = 2$, $m_F = 0$ of this state, a lamp using Rb^{87} or natural Rb filtered by a vat containing Rb^{85} for producing transitions between the levels $F = 1$ of the fundamental state and an excited level, and a detector completed by an electronic unit coupling a quartz oscillator to the atomic resonance.

3,667,067

ELECTRONIC CIRCUIT SUITABLE FOR USE AS FREQUENCY SELECTIVE AMPLIFIER OR OSCILLATOR

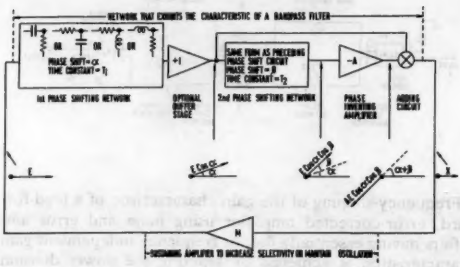
Derek Alfred Levell, 88 Galley Lane, Arkley, Barnet, England

Filed Mar. 18, 1971, Ser. No. 125,723

Claims priority, application Great Britain, Mar. 23, 1970, 14,038/70

Int. Cl. H03b *5/20*

U.S. Cl. 331—59 **12 Claims**


NETWORK THAT EXHIBITS THE CHARACTERISTIC OF A BANDPASS FILTER
1st PHASE SHIFTING NETWORK
OPTIONAL BUFFER STAGE
2nd PHASE SHIFTING NETWORK
PHASE INVERTING AMPLIFIER
ADDING CIRCUIT
DESIGNING AMPLIFIER TO INCREASE SELECTIVITY OR MAINTAIN OSCILLATION

An electronic circuit has two similar phase shift networks connected in cascade between a circuit input and the input of an amplifier providing a 180° phase-shift between its input and output. The output of the amplifier and first network are combined and the combination applied to the circuit output, providing an overall frequency response exhibiting a resonant frequency. The networks may be connected together via a buffer amplifier, and each comprises a resistance and a reactance interconnected to provide a phase lead or lag. The resonant frequency may be varied by varying the gain of the amplifier or the resistance or reactance of one or both networks. Variable gain feedback circuitry may be connected between the circuit output and input, so that the circuit is selectively operable as a frequency selective amplifier or oscillator in accordance with the gain of this circuitry.

3,667,068

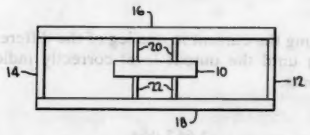
NUCLEAR CHARGED SELF-SUSTAINING LASER

Clyde A. Morrison, Wheaton; Donald E. Wortman, Rockville, and Ruben T. Farrar, Wheaton, all of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Aug. 17, 1970, Ser. No. 64,426

Int. Cl. H01s *3/09*

U.S. Cl. 331—94.5 **13 Claims**



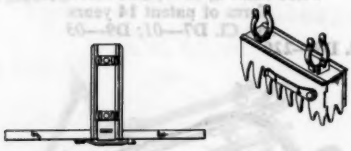
A nuclear charged solid state laser for which no external power supply is required. A large class of single crystals are disclosed which contain a stable isotope that is potentially radioactive. The crystal is doped with a laser impurity ion and is irradiated with nuclear energy such that the stable isotope becomes radioactive to provide a pumping source for the laser impurity ions therein. Optical resonator means can be provided by coating both ends of the crystal with highly reflective surfaces. The radioactive isotope provides a continuous internal power supply over the lifetime of its decay, thus providing a potentially compact, portable and inexpensive solid state laser device.

DESIGNS

MAY 30, 1972

223,695
GLOVE
Edna May Kirby, 33 Woodlands Ave., Walsall, England
Filed Mar. 24, 1970, Ser. No. 22,036
Claims priority, application Great Britain Sept. 27, 1969
Term of patent 3½ years
Int. Cl. D2—*06*
U.S. Cl. D2—375

223,696
FOLDABLE TRAP RAKE
Ralf Francis Mervyn Roughsedge, 1 Nancy St., St. Marys, near Sydney, New South Wales, Australia
Filed Sept. 25, 1970, Ser. No. 25,198
Claims priority, application Australia Apr. 20, 1970
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—13

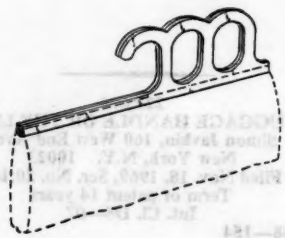


223,697
TIE ROD WRENCH
Walter Harold Finley, Orange County, Calif. (200 N. Gilbert St., Apt. 12, Anaheim, Calif. 92801)
Filed Dec. 7, 1970, Ser. No. 26,341
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—21

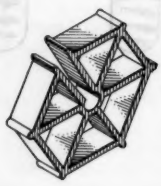
223,698
LUGGAGE HANDLE OR THE LIKE
Simon Javkin, 160 West End Ave., New York, N.Y. 10023
Filed Nov. 18, 1969, Ser. No. 20,163
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—154

223,699
COMBINED CLOSURE AND HANDLE FOR A CARRIER BAG
Seymour Kamins, Oceanside, Daniel Gelles, Kerhonkson, and Jerry Horodecky, Jackson Heights, N.Y., assignors to CTP Industries Inc., Brooklyn, N.Y.
Original design application Mar. 19, 1969, Ser. No. 16,328. Divided and this application Mar. 20, 1970, Ser. No. 22,223
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—154

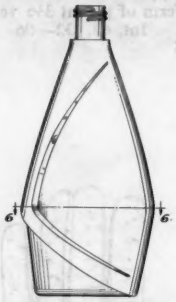
223,700
COMBINED CLOSURE AND HANDLE FOR A CARRIER BAG
Seymour Kamins, Oceanside, Daniel Gelles, Kerhonkson, and Jerry Horodecky, Jackson Heights, N.Y., assignors to CTP Industries Inc., Brooklyn, N.Y.
Original design application Mar. 19, 1969, Ser. No. 16,328. Divided and this application Mar. 20, 1970, Ser. No. 22,224
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—154



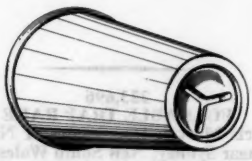
223,701
SUPPORT FOR CONCRETE REINFORCING ROD
John W. Lausch, 17784 Ash, Fountain Valley, Calif. 92708
Filed Sept. 4, 1970, Ser. No. 24,836
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—228



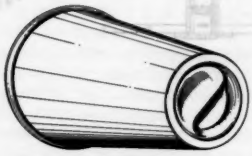
223,702
BOTTLE OR SIMILAR ARTICLE
Elliott E. Blank, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 4, 1970, Ser. No. 26,279
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—66



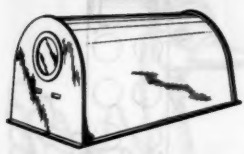
223,703
CUP
George A. Cheladze, Phoenix, Ariz., assignor to Carthage Cup Company, Carthage, Tex.
Filed Mar. 2, 1970, Ser. No. 21,670
Term of patent 14 years
Int. Cl. D7—*01;* D9—*03*
U.S. Cl. D9—220



223,704
CUP
George A. Cheladze, Phoenix, Ariz., assignor to Carthage Cup Company, Carthage, Tex.
Filed Mar. 2, 1970, Ser. No. 21,882
Term of patent 14 years
Int. Cl. D7—*01;* D9—*03*
U.S. Cl. D9—220

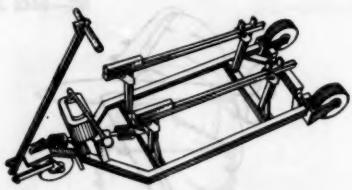


223,705
SNOWMOBILE SHELTER
Charles T. McCutcheon, Ferry Ave., Charlevoix, Mich. 49720, and John D. Cole, 3860 Honey Hill Lane, Dayton, Ohio 45405
Filed Mar. 11, 1970, Ser. No. 21,867
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

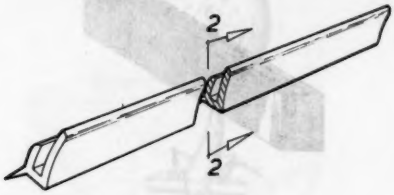


223,706
TELEPHONE BOOTH
Richard J. Hughes and Thomas W. Steinbach, Park Ridge, Ill., assignors to Acoustics Development Corporation, Northbrook, Ill.
Filed Feb. 8, 1971, Ser. No. 113,777
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1

223,707
DOLLY FOR SUPPORTING HELICOPTER AND THE LIKE
James Salisbury, 2455 23rd St., Santa Monica, Calif. 90405
Filed Oct. 26, 1970, Ser. No. 25,672
Term of patent 3½ years
Int. Cl. D12—*02*
U.S. Cl. D14—3

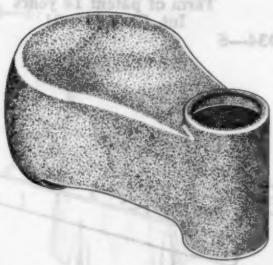


223,708
SEALING STRIP PRIMARILY FOR THE SLIDING ROOF OF A VEHICLE OR SIMILAR ARTICLE
Harry Edwards, Solihull, England, assignor to Weathershields Limited, Birmingham, England
Filed June 30, 1970, Ser. No. 23,766
Claims priority, application Great Britain Dec. 31, 1969
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6

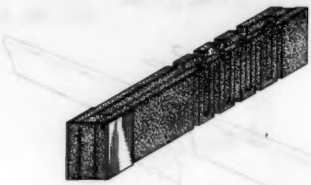


223,709
SNOWMOBILE SEAT
Yves Anselme Lapointe, Valcourt, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada
Filed Nov. 2, 1970, Ser. No. 25,769
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—24

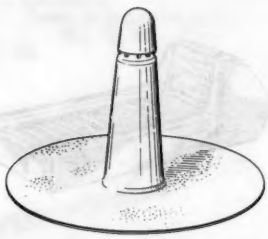
223,710
LIQUID RECEPTACLE FOR VAPORIZER
Nat Camp, 395 Westchester Drive, Port Chester, N.Y. 10573
Filed Dec. 18, 1970, Ser. No. 26,560
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—148



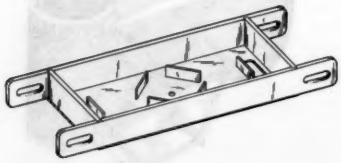
223,711
IGNITER OR SIMILAR ARTICLE
Stanley J. Matys, Lancaster, N.Y., assignor to Igniters, Inc., Lancaster, N.Y.
Filed June 15, 1970, Ser. No. 23,489
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—129



223,712
ROOF INSULATION VENTILATOR
Robert W. Mason, Port Credit, Ontario, Canada, assignor to Marathon Equipment & Supply Limited, Weston, Ontario, Canada
Filed Aug. 21, 1970, Ser. No. 24,632
Term of patent 14 years
Int. Cl. D23—*04;* D29—*02*
U.S. Cl. D23—153



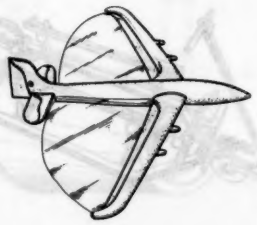
223,713
GAME BOX
Charl[illegible] P. Reay, 1116 Watson Woods Drive, St. Louis, Mo. 63122
Continuation of design applications Ser. No. 16,181, Mar. 11, 1969, and Ser. No. 20,623, Dec. 29, 1969, both now abandoned. This application Dec. 24, 1970, Ser. No. 26,737
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



223,714
COMBINED GAME BOARD AND CHIP HOLDER OR THE LIKE
Don W. Kester, 5125 S. Medley Court, Seattle, Wash. 98118
Filed Nov. 23, 1970, Ser. No. 26,112
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

223,715
SNOW SCOOTER
Clarence R. Lennox, 7032 82nd St., Edmonton, Alberta, Canada
Filed Apr. 23, 1970, Ser. No. 22,580
Claims priority, application Canada Nov. 26, 1970
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

223,716
KITE
Chan Choong, 96 Violet House, 291 Ngau Tau Kok Road, Kowloon, Hong Kong
Filed Nov. 23, 1970, Ser. No. 26,124
Claims priority, application Great Britain June 9, 1970
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



223,717
SEAT FOR A HOBBY HORSE OR THE LIKE
Cid Garrison, 150 E. 69th St., New York, N.Y. 10021
Filed Nov. 24, 1970, Ser. No. 26,146
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

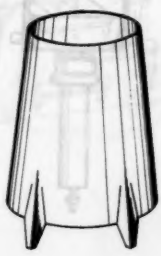
223,718
SEAT FOR A HOBBY HORSE OR THE LIKE
Cid Garrison, 150 E. 69th St., New York, N.Y. 10021
Filed Nov. 24, 1970, Ser. No. 26,147
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—15

223,719
NAPKIN HOLDER
Ruth L. Dixon, 6487 Scimitar Drive, San Diego, Calif. 92114
Filed June 17, 1970, Ser. No. 23,535
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—20

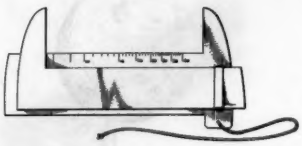
223,720
LAMP
George A. Klupp, Jr., 419 Cook Ave., Billings, Mont. 59102
Filed Oct. 30, 1970, Ser. No. 25,781
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

223,721
POCKET LIGHTER
Peter Weissman, Schnaittach, Germany, assignor to Consul Gesellschaft mit beschrankter Haftung, Nuremberg, Germany
Filed Oct. 19, 1970, Ser. No. 25,552
Claims priority, application Germany May 19, 1970
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

223,722
CHARCOAL FIRE STARTER
Adrian W. Stehouwer, 353 Michigan St. NE., Grand Rapids, Mich. 49503
Filed Oct. 23, 1970, Ser. No. 25,625
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D48—27

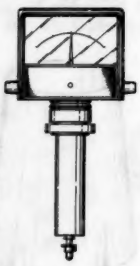


223,723
DISTANCE SIGHT MEASURING DEVICE
Maxwell O. Thompson, 701 Lokchapee Drive, Macon, Ga. 31204
Filed July 21, 1970, Ser. No. 24,045
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6

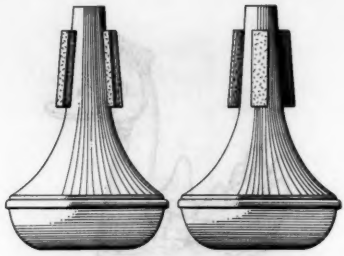


223,724
WATER METER DIAL COVER
Paul H. Wallace, R.R. 1, Cynthiana, Ind. 47612
Filed Sept. 17, 1970, Ser. No. 25,033
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D52—6

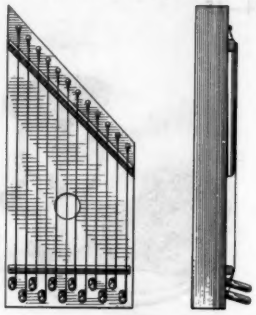
223,725
ELECTRONIC MICROMETER
Makoto Takagi, Tokyo, Japan, assignor to Tokyo Seimitsu Co., Ltd., Tokyo, Japan
Filed Sept. 24, 1970, Ser. No. 25,172
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D52—6



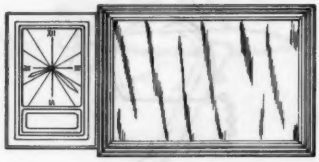
223,726
MUTE
Gordon Thomas Crown, 4116 Greenview Ave., Chicago, Ill. 60613
Filed Apr. 16, 1970, Ser. No. 22,464
Term of patent 14 years
Int. Cl. D17—*99*
U.S. Cl. D56—1



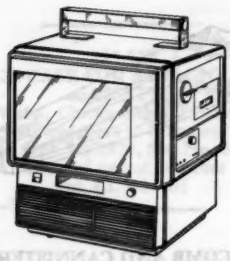
223,727
HARP
Henry Levin, 80 St. Marks Place, New York, N.Y. 10003
Filed Aug. 19, 1970, Ser. No. 24,581
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1



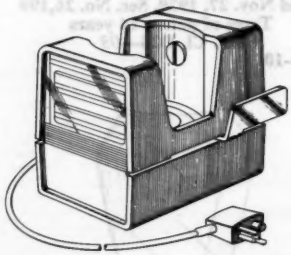
223,728
COMBINED REAR PROJECTION VIEWER AND CLOCK
Willis L. Wells, Clayton, Mo., assignor to VueTech Corporation, St. Louis, Mo.
Filed May 13, 1970, Ser. No. 22,945
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



223,729
MOTION PICTURE SOUND PROJECTOR-VIEWER UNIT
Isao Katayama, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan, fractional part interest to each
Filed Nov. 23, 1970, Ser. No. 26,116
Claims priority, application Japan May 23, 1970
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1

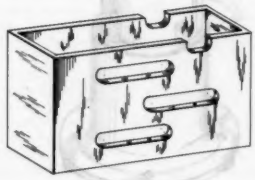


223,730
CAMERA FLASH ATTACHMENT OR SIMILAR ARTICLE
Edward K. Bullock, Marblehead, and Edward F. Burke, Jr., Reading, Mass., James M. Conner, Westchester, N.Y., Milton S. Dietz, Lexington, and John B. Morse, Cambridge, Mass., and Alvin R. Tilley, Red Bank, N.J., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 24, 1970, Ser. No. 26,636
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

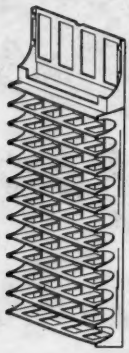


223,731
COMBINED TYPEWRITER, RECORDING DEVICE AND ENCLOSURE THEREFOR
Clarence D. Zierhut, 16909 Flanders, Granada Hills, Calif. 91344
Filed Sept. 30, 1970, Ser. No. 22,244
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

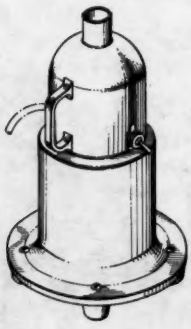
223,732
REMINDER INDEX BOX
Stephen B. Misenko, 1350 E. Boston Road, Broadview Heights, Ohio 44147
Filed Mar. 10, 1970, Ser. No. 21,835
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—2



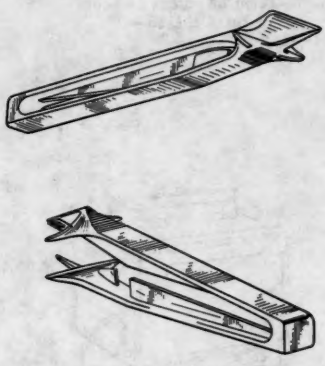
223,733
CIGARETTE MERCHANDISER
Robert B. Nielsen, Park Ridge, Ill., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.
Filed Dec. 7, 1970, Ser. No. 26,342
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9



223,734
HOUSING FOR BLOWER, VACUUM OR SIMILAR AIR CIRCULATING DEVICE
Joseph A. La Barber, Kern City, Calif., assignor to Henry Welland, Hacienda Heights, Calif.
Filed Sept. 1, 1970, Ser. No. 24,796
Term of patent 14 years
Int. Cl. D24—*99;* D15—*05*
U.S. Cl. D83—1



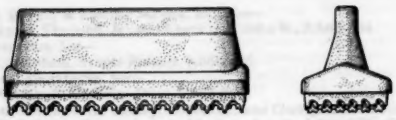
223,735
SUTURE CUTTER
Albert E. Straus, Erie, Pa., assignor to Perry Plastics, Inc., Erie, Pa.
Filed June 15, 1970, Ser. No. 23,467
Term of patent 14 years
Int. Cl. D24—*03;* D28—*03*
U.S. Cl. D83—12



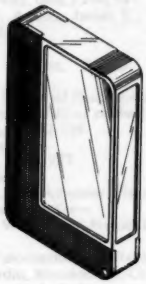
223,736
COMBINED COMB AND CANNISTER CARRIER
Alan E. Legere, 9 Superior St., Lynn, Mass. 01902
Filed June 1, 1970, Ser. No. 23,234
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

223,737
HAIR SPRAY SHIELD
Eva North Smith, 2104 E. Stop 12 Road, Apt. C, Indianapolis, Ind. 46227
Filed Nov. 27, 1970, Ser. No. 26,199
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

223,738
BRUSH
Karl A. Stein, 12 Beverly Place, Dayton, Ohio 45419
Filed Feb. 26, 1971, Ser. No. 119,441
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D86—13



223,739
STORAGE CASE FOR A MAGNETIC TAPE CASSETTE
Reinhold M. Weiss, Chicago, and T. Michael Dennehey, La Grange, Ill., assignors to Memorex Corporation
Filed Sept. 14, 1970, Ser. No. 24,968
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1



223,740
TIRE
Hannelore Weinhold, Hanau am Main, Germany
(% Fort Dunlop, Erdington, Birmingham 24, England)
Filed Oct. 30, 1970, Ser. No. 25,756
Claims priority, application Great Britain May 1, 1970
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

223,741
RAZOR OR SIMILAR ARTICLE
William R. Pomper, Highland Park, Ill.
(140 S. Dearborn St., Chicago, Ill. 60603)
Filed Jan. 5, 1971, Ser. No. 104,192
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF MAY, 1972

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Basard, Robert; Stoll, Pierre E. C.; and Sedes, Pierre H., to International Standard Electric Corporation. Simulator for monopulse radar having coherent doppler features. 3,665,616, Cl. 35-10.400

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Bata, George Thomas; Carruth, Winford Boyd; and Gosnell, Thomas Francis, to Bendix Corporation, The. Fluid level detector. 3,666,903, Cl. 200-61.050

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Bayer, Otto, to Heraeus-Schott Quarzschmelze GmbH. Method of producing transparent or opaque fused silica or glass with a high silicon content. 3,666,414, Cl. 106-52.

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Becker, Willi, to Pfeiffer, Arthur, Hochvakuumtechnik GmbH. Rotary molecular vacuum pump. 3,666,374, Cl. 415-100.000

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Bernstein, Jack; and Losee, Kathryn Alice, to Squibb, E. R., & Sons, Inc. Substituted triiodoisophthalamic acids. 3,666,800, Cl. 260-518.00a

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Bogue, John C.; and Sarbacher, Robert I., said Sarbacher assor. to said Bogue. Electrical power supply. 3,666,962, Cl. 307-65.

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Daley, Thomas J., to Westinghouse Electric Corporation. Wind direction recording system. 3,665,759, Cl. 73-188.

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Davis, Edwin J.; and Tolson, Bill A., to United States of America, National Aeronautics and Space Administration. Cable stabilizer for open shaft cable operated elevators. 3,666,051, Cl. 187-1.000

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Dawn, Frederick S.; and Gill, William L., to United States of America, National Aeronautics and Space Administration. Burn rate testing apparatus. 3,665,750, Cl. 73-15.00r

Dawson, Robert William, to Bell Telephone Laboratories, Incorporated. Reverse bias pulsing of junction diodes to reduce deterioration. 3,666,960, Cl. 307-311.000

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Georgiev, Tancho D.; and Scanzani, Robert M. Buoyant structure. 3,665,882, Cl. 114-0.50f
Gerdes, Theo: *See—*
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German, William H. Ship construction. 3,665,886, Cl. 114-73.000
Gerow, Milo. Extrusion die. 3,666,390, Cl. 425-380.000
Gersch, Josef: *See—*
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Gessler, Hans, to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung. Silo discharging device. 3,666,117, Cl. 214-17.
Gettmann, Hermann: *See—*
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Giatti, Filippo, to AMF Incorporated. Double length filter plug and cigarette connector sheet applicator. 3,665,930, Cl. 131-21.00r

Gibson, Earl D., to North American Rockwell Corporation. Coarse carrier phase correction system. 3,667,050, Cl. 325-323.000

Gidon, Marie-Claire: *See—*
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Gier, Delta W.; and Wasleski, Daniel M. Chloronitrophenyl ethers as herbicides. 3,666,814, Cl. 260-590.000

Gieseke, Hans Alwin Erich, deceased (by Gieseke, Ingrid Nora Hansine, heir); Nogaj, Alfred; Schiefer, Josef; and Rinkler, Heinrich, to Farbenfabriken Bayer Aktiengesellschaft. Method of and apparatus for drying wet filament tows. 3,665,613, Cl. 34-9.

Gihring, Daniel A.: *See—*
Burke, William F.; Gihring, Daniel A.; and Jones, Thomas E.,3,666,928.

Gilbert, Daniel Eugene; Nelson, Larry Ralph; Sturgeon, Charles Edwin; and Thom, Robert Keith, to Vulcan Materials Company. Pulverulent drain cleaning composition. 3,666,670, Cl. 252-160.

Gilbert, Ina. Design elements for creating artistic compositions. 3,665,617, Cl. 35-27.000

Gilchrist, David W. Spherical game. 3,666,269, Cl. 273-115.000

Gilham, George Henry, deceased (by Gilham, Gay Maude, administratrix); and Door, Wesley R., to USM Corporation, mesne. Ring cutting tool. 3,665,797, Cl. 83-411.000

Gill, Homer R., to Goodyear Tire & Rubber Company, The. End post insulator. 3,666,175, Cl. 238-152.000

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Girling Limited: *See—*
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Glacier Metal Company Limited, The: *See—*
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Global Marine Inc.: *See—*
Michaelsen, Randolph C. H., 3,665,587.

Globe-Union Inc.: *See—*
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Gluskin, Richard S., to United States of America, Army. Pneumatic level sensing device. 3,666,263, Cl. 271-56.000

Goal Company Limited: *See—*
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Gochot, Jean. Butterfly valve. 3,666,236, Cl. 251-306.000

Godfrey, Norman Bell, to Jefferson Chemical Company, Inc. Polyamine and hydrocarbon sulfonic acid accelerator combination for epoxy curing. 3,666,721, Cl. 260-47.0ec

Godwin, Gurney L.; and Kilgore, Lee A., to Westinghouse Electric Corporation. Alternating current motor starting apparatus and method. 3,667,015, Cl. 318-171.

Goeldner, Richard W., to Aqua-Chem, Inc., mesne. Reverse osmosis liquid separation apparatus. 3,666,109, Cl. 210-321.

Goffe, Charles A., to Eastman Kodak Company. Element, composition and process. 3,666,477, Cl. 96-114.100

Goldbach, Manfred, to Hauni-Werke Korber & Co., KG. Apparatus for feeding and classifying cut tobacco. 3,665,932, Cl. 131-21.

Goldman, Wolf: *See—*
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Gonzalez, Vicente Emo. Concealable beds. 3,665,527, Cl. 5-10.00b

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Gottlieb, Robert. Popcorn popper. 3,665,839, Cl. 99-238.6

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Grasselli, Robert K.; and Friedrich, Maria S., to Standard Oil Company, The. Uranium-molybdenum oxidation catalysts. 3,666,822, Cl. 260-680.

Grasselli, Robert K.; and Friedrich, Maris a S., to Standard Oil Company, The. Uranium-arsenic oxidation catalysts. 3,666,823, Cl. 260-680.

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Green, Harry W., to Standard Products Company, The. Apparatus for multi-stage treatment of waste material. 3,666,106, Cl. 210-201.000

Greene, Michael L., to United States of America, Navy. Coring apparatus for taking samples of the ocean floor. 3,666,028, Cl. 175-189.000

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Griffith, Arthur G. Eyeglass temple. 3,666,355, Cl. 351-118.

Griggers, Arthur U. Supporting frame for receptacle with anchor therefor. 3,666,222, Cl. 248-146.000

Grinoch, Abraham, to United States of America, Army. Sensor for detecting radio frequency currents in carbon bridge detonator. 3,667,040, Cl. 324-106.000

Griparis, Andrew Geo., to Diversey Corporation, The. Apparatus for cleaning tanks and associated pipelines. 3,665,941, Cl. 134-58.00r

Grobert, Paul H., to Communications & Systems, Inc. Four quadrant multiplier using pulse width modulators and the digital exclusive-or. 3,666,933, Cl. 235-194.

Groezinger, Gerhard, to Mayer & Cie. Electrical pattern mechanism for circular knitting machines. 3,665,731, Cl. 66-50.

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Groh, Margit; and Oetiker, Alfred. Ciba Limited Photographic material containing aliphatic perfluoro compounds. 3,666,478, Cl.

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Grosse, Aristid V.; Stokes, Charles S.; and Smith, Edward W. Process for the production of oxides of nitrogen. 3,666,408, Cl. 23-163.

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Groth, Rolf; Van Boort, Henricus Johannes Joseph; and De Neve, Gerard Marie Jules, to U.S. Philips Corporation. Method of manufacturing glass articles having a heat-reflecting film. 3,666,534, Cl. 117-97.000

Groth, Rolf; Van Boort, Henricus Johannes Joseph; De Neve, Gerard Marie Jules; Bullard, Edward M.; and Bullard, Edward M., to U. S. Philips Corporation Mobil Oil Corporation Mobil Oil Corporation. Method of manufacturing glass articles having a heat-reflecting film Oriented thermoplastic films comprising polypropylene and poly(para-tertiary-butyl- styrene) Oriented thermoplastic films comprising polypropylene and poly(para-tertiary-butyl- styrene). 3,666,834, Cl. 260-897.

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Gulistan, Bulent, to Deutsch Fastener Corporation. Flaring tool. 3,665,581, Cl. 29-243.520

Gurevich, Albert Efimovich; Rozenbljum, Boris Fishelevich; and Shaposhnikov, Igor Nikolaevich. Device for matching number of operating bridges on converting substations of direct-current transmission lines. 3,666,963, Cl. 307-82.

Gurkin, Martin; Sanderson, Gary Warner; and Graham, Harold Nathan, to Lipton, Thomas J., Inc. Process for making a spray-dried instant tea of desired bulk density. 3,666,484, Cl. 99-77.000

Gust, Raymond E., to Courtesy Products Corporation. Beverage dispensing apparatus having adjustable piston stroke. 3,666,142, Cl. 222-16.000

Gustafson, Roy H. J. A., to Sperry Rand Corporation. Submersible vehicle bouyancy control. 3,665,884, Cl. 114-16.00e

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Gutman, Arnold D., to Stauffer Chemical Company. Oximinophosphonodithioates. 3,666,839, Cl. 260-940.000

Gutshall, Charles E., to Textron, Inc. Drill screw. 3,665,801, Cl. 85-41.

Guttmann, Stephan; and Huguenin, Rene. 2' β-Isopropyl-5' α-n-propyl-9,10-dihydro- ergopeptines. 3,666,762, Cl. 260-268.

Guyaux, James R., to FMC Corporation. Cargo handling apparatus. 3,666,127, Cl. 214-512.000

Gwyn, Childress B., Jr., to Contacts, Incorporated. Method and apparatus for feeding discrete parts to a cold heading machine. 3,666,160, Cl. 228-3.000

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Haas, Werner Erwin Louis; Adams, James E.; Flannery, John B., Jr.; and Mechlowitz, Bela, to Xerox Corporation. Liquid crystal infrared imaging system having an undisturbed image on a disturbed background and having an infrared radiation absorptive material dispersed throughout the liquid crystal. 3,666,947, Cl. 250-83.

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Haertling, Gene H., to United States of America, Atomic Energy Commission. Ferroelectric ceramic materials. 3,666,666, Cl. 252-62.900

Hafner, Karl-Heinz; and Cherdron, Harald. Polyacetals stabilized with secondary alkali metal phosphates. 3,666,714, Cl. 260-45.7

Hagen, Marcus W., to Outboard Marine Corporation. Outboard motor with pre-select tilt lock. 3,666,218, Cl. 248-4.

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Hall, Roger P., to SCM Corporation. Method of bonding a resinous film to a substrate using high energy radiation. 3,666,591, Cl. 156-272.

Haller, John, to Federal-Mogul Corporation. Method of making composite wear resistant articles, such as face seals. 3,666,456, Cl. 75-208.000

Halliburton Company: *See—*
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Hallman, Newt M., to Universal Oil Products Company. Hydroprocessing product separation. 3,666,658, Cl. 208-103.

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Hansen, Kjell T., to Farinon Electric. Carrier supply with synchronous redundancy. 3,667,048, Cl. 325-157.

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Harland Simon Limited: *See—*
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Harmens, Alexander, to Petrocarbon Developments Limited. Synthesis of ammonia. 3,666,415, Cl. 23-199.000

Harper, Robert C., to Cincinnati Milling Machine Company. Method of producing closed mold polyurethane foam moldings free of surface voids by flushing the mold with a vaporized halogenated hydrocarbon. 3,666,848, Cl. 264-39.

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Harr, Jerome D., to International Business Machines Corporation. Recording and reproducing system with video heads reading both information data from oblique tracks and address data from the longitudinal control track. 3,666,897, Cl. 179-100.20t

Harrington, Richard H., to International Business Machines Corporation. High speed front impact printer. 3,665,852, Cl. 101-93.00c

Harris, Allen E., to Halliburton Company. Packer sleeves. 3,666,010, Cl. 166-134.000

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Harris, Frank L.; and Levine, Sidney. Process for anodizing aluminum materials. 3,666,638, Cl. 204-35.00n

Harris, Paul Anthony; and Phoenix, Lancelot, to Lucas, Joseph, (Industries) Limited. Speed limiting systems for internal combustion engines. 3,665,903, Cl. 123-102.000

Harris, Richard T. Mobile storage box. 3,666,312, Cl. 296-1.00r

Harris, Robert R.; and Kressman, Carl H., to Sherwin-Williams Company, The. Water-soluble polyester resin containing phenylindan dicarboxylicaacid. 3,666,698, Cl. 260-22.00m

Harter, Clair M. Method and apparatus for making sleeves. 3,665,744, Cl. 72-129.000

Hartmeister, Ruben J.; and Maytag, John Hardy, to Coors Porcelain Company. Continuous printer and skip-print mechanism. 3,665,853, Cl. 101-247.

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Hashimoto, Yoshiaki; and Hayakawa, Masatosi, to Chukyo Electric Co., Ltd. Apparatus for controlling rectilinear motion. 3,665,812, Cl. 92-24.

Haskins, Roy. Detachable storage bin and trailer. 3,666,129, Cl. 214-515.000

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Hatton, Jay T. Blower attachment for reel type lawn mower. 3,665,687, Cl. 56-12.9

Haug, Walter, to Kassbohrer, Karl, Fahrzengwerke, G.m.b.H. Steering mechanism for tracked vehicles, especially snow mobiles. 3,666,033, Cl. 180-6.48

Haugh, John C., to General Mills Chemicals, Inc. Inhibition of crystallization of liquid epoxy resins. 3,666,702, Cl. 260-29.2

Hauni-Werke Korber & Co., KG: *See—*
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Hauser, Paul; Pfister, Walter; Stucki, Hans Ulrich; Teuwen, Heinz; Fuhring, Heinrich; and Sieber, Johannes Helmut, to Bohler & Weber K.G.-Maschinenfabrik-Augsburg. Apparatus for finishing fibrous material. 3,665,734, Cl. 68-18.

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Havno, Kaj, to Christiani & Nielsen A/S. Method of stabilizing sand foundations under building works submerged in water. 3,665,720, Cl. 61-46.000

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Hayami, Tadao, to Kabushiki Kaisha Koparu. Device for selectively switching-over the speed of feeding film in motion picture projector. 3,666,357, Cl. 352-180.000

Healy, Mark, to Senninger Irrigation, Inc. Sprinkler head apparatus. 3,666,181, Cl. 239-206.000

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Heath, Ronald Alfred, to Lucas, Joseph, (Industries) Limited. Fluid operated servomechanism. 3,665,806, Cl. 91-52.000

Hefner, Chester W., Jr. Gun stock cover. 3,665,990, Cl. 150-52.00r

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Pincus, Ralph M. Selection apparatus and circuitry. 3,666,873, Cl. 35-48.00r

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Pitasi, Carl R., to Xerox Corporation. Magnetic brush development apparatus. 3,665,891, Cl. 118-637.

Pitches, Brian Edward; and Murray, Srobert Malcolm Stuart, to Ferranti Limited. Airflow direction indicators. 3,665,760, Cl. 73-188.000

Plotnikoff, Nicholas Peter, to Abbott Laboratories. 3,4-Dicarbethoxy-β-phenethylcarbamic acid, ethyl ester in treating depression. 3,666,859, Cl. 424-300.

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Post, Carl A.; and Cabanaw, Eldred J., to Phillips Petroleum Company. Condensate purification and recovery for use as dilution steam to pyrolysis furnace. 3,666,828, Cl. 260-683.

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Price, David B., to Westinghouse Electric Corporation. Base containing an electric heater element and an automatic temperature control for supporting glass or ceramic cookware. 3,666,920, Cl. 219-449.

Price, Edward W., to United States of America, Navy. Igniter-attenuator device for attenuating combustion instability in rocket motors. 3,665,706, Cl. 60-39.72p

Price, Glenn R.; and Walsh, Edward N., to Stauffer Chemical Company. Phosphorylated heterocyclic compounds as herbicides. 3,666,435, Cl. 71-87.000

Price, Richard Thompson, to Organon, Inc. Diagnostic test slide. 3,666,421, Cl. 23-253.0tp

Priest, Ernest H.; and Priest, Gordon M. Pumping a high or low temperature fluid. 3,666,375, Cl. 415-112.

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Przygocki, Witold C., to Murray-Way Corporation. Abrasive belt control apparatus and method. 3,665,650, Cl. 51-135.0bt

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Pusche, Herbert; Sander, Harry; and Neuss, Hans-Wilhelm, to Knapsack Aktiengesellschaft. Safety device for preventing the return movement of electrodes in electric furnaces or similar apparatuses. 3,666,868, Cl. 13-15.000

Putscher, Johann; Gersch, Josef; Wiedemann, Otto; Winker, Alfred; and Winkler, Alfred, to Agfa-Gevaert Aktiengesellschaft. Container for photographic film. 3,665,829, Cl. 95-31.0ca

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Quinn, Bert A. Door closer. 3,665,549, Cl. 16-52.000

Quinn, James L. Control for sump pump. 3,667,022, Cl. 318-482.000

Rabatin, Jacob G.; and Bradshaw, Evelyn, to General Electric Company. Terbium activated rare earth oxyhalide phosphors containing ytterbium for reduced afterglow. 3,666,676, Cl. 252-301.4

Radnich, Spencer I.; Davelman, Samuel; Symonds, Paul S.; and Taylor, Willis H., to United States of America, Army. Base ejecting ordance projectile. 3,665,857, Cl. 102-1.00r

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Rakes, Rodney G., to Sperry Rand Corporation. Brushless D.C. motor having electronic commutation responsive to rotor position and induced armature winding voltage. 3,667,018, Cl. 318-254.000

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Ramirez, Antonio. Starter device for single phase A. C. motors. 3,667,017, Cl. 318-221.00e

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Ranzato, Mario. Electronically operated stringed instruments. 3,666,875, Cl. 84-1.13

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Rasmussen, Robert F., to Roseville Engineering, Inc., mesne. Pump. 3,666,382, Cl. 417-533.000

Rath, Eric. Contaminant containment method and apparatus. 3,665,713, Cl. 61-1.00f

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Reedy, Albert J.; and White, Walter R., to Eastman Kodak Company. Dimensionally stable matte-surfaced polyester drafting film. 3,666,532, Cl. 117-76.00f

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Reimann, Gerhard P. Convertible seat-bed for automobiles. 3,666,315, Cl. 296-69.

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Yoshino, Masataka; Kamiya, Akimi; Ogawa, Nin; Oguri, Atsushi; and Muramatsu, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for effecting continuous and simultaneous transfer of heat and moisture between two air streams. 3,666,007, Cl. 165-166.000
Yoshino, Stanley Y., to North American Rockwell Corporation. Apparatus for forming layup laminate. 3,666,600, Cl. 156-382.
Youmans, Donald W., to FMC Corporation. Movable load support for self loading vehicle. 3,666,122, Cl. 214-77.00r
Young, Patrick J.: *See—*
Keller, Harold A.; and Young, Patrick J.,3,666,592.
Youngquist, Mary J., to Eastman Kodak Company. Photographic product, composition and process. 3,666,457, Cl. 96-29.00r
Yugen Kaisha Yamanaka Seisakusho: *See—*
Yamanaka, Sadajiro, 3,665,648.
Yuri, Yoshio; and Tanaka, Yukio. Fluidized bed furnace. 3,666,253, Cl. 266-5.00e
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DeForest, William S.; Heap, Richard T.; Widmont, Joseph C.; and Zagorin, Harold,3,666,639.
Zaimis, Eleanor; and Hanington, Edda, to Boehringer Ingelheim G.m.b.H.Methods for treating migraine which use 2-(2',6'-dichlorophenyl-amino-1,3-diazacyclopentene-(2). 3,666,861,, Cl. 424-273.
Zajaczkowski, Ernest J., to Eaton Corporation. Cross porting structure. 3,666,048, Cl. 184-7.00e
Zarzycki, Vincent F. Cover for door lock assembly. 3,666,309, Cl. 292-337.000
Zaydel, Wieslaw S., to General Motors Corporation. Closure latch. 3,666,307, Cl. 292-216.000
Zegers, Leo Eduard; Kuilman, Jan; and Snijders, Wilfred Andre Maria, to U.S. Philips Corporation, mesne. Transmission system. 3,666,889, Cl. 179-15.
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Zenith Radio Corporation: *See—*
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Zoltok, Harry, to Motor Coach Industries Limited. Door assembly for baggage compartments and the like. 3,665,645, Cl. 49-248.000
Zubov, Vitaly Pavlovich: *See—*
Kargin, Valentin Alexeevich; Polak, Lev Solomonovich; Kabanov, Viktor Alexandrovich; Zubov, Vitaly Pavlovich; and Pankova, Valentina Fedorovna,3,666,740.
Zummler, Donald R., to United States of America, National Aeronautics and Space Administration. Low-mass truss structure. 3,665,670, Cl. 52-648.
Zummler, Donald R.; McLain, Bruce H.; Sallee, John P.; and Ashton, Shirley B., to United States of America, National Aeronautics and Space Administration! Air Control Industries, Inc. Low-mass truss structure Electrostatic air cleaner. 3,665,679, Cl. 55-137.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF MAY, 1972

NOTE.--Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, Charles M., to The Galigher Co. Flotation machine and stator therefor. Re. 27,380, 5–30–72, Cl. 209–169.

Battelle Development Corp., The: *See*—
Little, Lawrence L. Re. 27,381.

British Iron and Steel Research Association: *See*—
Roberts, Raymond J., and Hoyle. Re. 27,379.

Consarc Corp. and British Iron and Steel Research Association: *See*—
Roberts, Raymond J., and Hoyle. Re. 27,379.

Extracorporeal Medical Specialties, Inc.: *See*—
Pickup, Robert E. Re. 27,376.

Galigher Co., The: *See*—
Anderson, Charles M. Re. 27,380.

Hoyle, Geoffrey: *See*—
Roberts, Raymond J., and Hoyle. Re. 27,379.

Johnson, Arthur F. Process and apparatus for filtering effluent produced from aluminum reduction cells. Re. 27,383, 05–30–72. Cl. 204–67.

Little, Lawrence L., to The Battelle Development Corp. Preparation of imitation sour cream. Re. 27,381, 5–30–72, Cl. 99—54.

Lohn, Edwin E. Universal carburetor-manifold adaptor. Re. 27,378, 5–30–72, Cl. 138–39.

Minnesota Mining and Mfg. Co.: *See*—
Puerckhauser, Gerhard W. R., Sagawa, and Wittnebel. Re. 27,375.

Mitsui Toatsu Chemicals Inc.: *See*—
Otsuka, Eiji, and Saida. Re. 27,377.

Otsuka, Eiji, and Toyoyasu Saida, to Mitsui Toatsu Chemicals Inc., Synthesis of urea. Re. 27,377, 5–30–72, Cl. 260—555.

Pickup, Robert E., to Extracorporeal Medical Specialties, Inc. Roller pump heads. Re. 27,376, 5–30–72, Cl. 417—477.

Puerckhauer, Gerhard W. R., Burt K. Sagawa, and Bruce W. Wittnebel, to Minnesota Mining and Mfg. Co. Image receptor sheets containing organic silver salts and metal ion image. Re. 27,375, 5–30–72, Cl. 96—94.

Roberts, Raymond J., and G. Hoyle, to Consarc Corp. and British Iron and Steel Research Association. Consumable electrode furnace for electroslag refining. Re. 27,379, 5–30–72, Cl. 13—9.

Sagawa, Burt K.: *See*—
Puerckhauer, Gerhard W. R., Sagawa, and Wittnebel. Re. 27,375.

Saida, Toyoyasu: *See*—
Otsuka, Eiji and Saida. Re. 27,377.

Schlosser, Paul W. Piston assembly for pump. Re. 27,382, 5–30–72. Cl. 417—439.

Wittnebel, Bruce W.: *See*—
Puerckhauer,. Gerhard W. R., Sagawa, and Wittnebel. Re. 27,375.

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Anderson, Frederic W., to Reedley Nursery, Inc. Nectarine tree. 3,202, 5–30–72, Cl. 41.

Devor Nurseries, Inc.: *See*—
Lammerts, Walter E. 3,203.

Hartmann, Hudson T., to The Regents of the University of California. Fruitless olive tree. 3,197, 5–30–72, Cl. 33.

Hill Top Orchards & Nurseries, Inc.: *See*—
Miller, Henry W., Jr. 3,198.

Honeycutt, William T. Walnut tree. 3,200, 5–30–72, Cl. 32.

Irwin Greenhouses, Inc.: *See*—
Irwin, James T. 3,204.

Irwin, James T., to Irwin Greenhouses, Inc. Kalanchoe plant. 3,204, 5–30–72, Cl. 68.

Lammerts, Walter E., to Devor Nurseries, Inc. Rose plant. 3,203, 5–30–72, Cl. 21.

Miller, Henry W., Jr., to Hill Top Orchards & Nurseries, Inc. New and distinct variety of apple tree named Spureerome. 3,198, 5–30–72, Cl. 34.

Patterson & Hale: *See*—
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Sherrill, Lewis B., to Patterson & Hale. Peach tree. 3,199, 5–30–72, Cl. 43.

Trinta, Manuel S. Almond tree. 3,201, 5–30–72. Cl. 30.

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Blank, Elliott E., to Dow Chemical Company. Bottle or similar article. 223,702, 5–30–72, Cl. D9—66.

Bombardier Ltd.: *See*—
Lapointe, Yves A. 223,709.

Bullock, Edward K., E. F. Burke, J. M. Conner, M. S. Dietz, J. B. Morse, and A. R. Tilley, to Polaroid Corporation. Camera flash attachment or similar article. 223,730. 5–30–72, Cl. D61—1.

Burke, Edward F., Jr.: *See*—
Bullock, Edward K., Burke, Conner, Dietz, Morse, and Tilley. 223,730.

CTP Industries Inc.: *See*—
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CTP Industries Inc.: *See*—
Kamins, Seymour, Gelles, and Horodecky. 223,700.

Camp, Nat. Liquid receptacle for vaporizer. 223,710, 5–30–72, D23—148.

Carthage Cup Co.: *See*—
Cheladze, George A. 223,703.
Cheladze, George A. 223,704.

Cheladze, George A., to Carthage Cup Co. Cup. 223,703, 5–30–72, Cl. D9—220.

Cheladze, George A., to Carthage Cup Co. Cup. 223,704, 5–30–72, Cl. D9—220.

Choong, Chan. Kite. 223,716, 5–30–72, Cl. D34—915.

Cole, John D.: *See*—
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Consul Gesellschaft mit beschrankter Haftung: *See*—
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Dietz, Milton S.: *See*—
Bullock, Edward K., Burke, Coner, Dietz, Morse, and Tilley. 223,730.

Dixon, Ruth L. Napkin holder. 223,719, 5–30–72, Cl. D44—20.

Dow Chemical Co.: *See*—
Blank, Elliott E. 223,702.

Edwards, Harry, to Weathershields Ltd. Sealing strip primarily for the sliding roof of a vehicle or similar article. 223,708, 5–30–72, Cl. D14—6.

Finley, Walter H. Tie rod wrench. 223,697, 5–30–72. Cl. D8—21.

Garrison, Cld. Seat for a hobby horse or the like. 223,717, 5–30–72. Cl. D34—15.

Garrison, Cld. Seat for a hobby horse or the like. 223,718, 5–30–72. Cl. D34—15.

Gelles, Daniel: *See*—
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Gelles, Daniel: *See*—
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Horodecky, Jerry: *See*—
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Kamins, Seymour, Gelles, and Horodecky. 223,700.

Hughes, Richard J., and T. M. Steinback, to Acoustics Development Corp. Telephone booth. 223,706, 5–30–72, Cl. D13—1.

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Javkin, Simon. Luggage handle or the like. 223,698, 5–30–72, Cl. D8—154.

Kamins, Seymour, D. Gelles, and J. Horodecky, to CTP Industries Inc. Combined closure and handle for a carrier bag. 223,699, 5–30–72, Cl. D8—154.

Kamins, Seymour, D. Gelles, and J. Horodecky, to CTP Industries Inc. Combined closure and handle for a carrier bag. 223,700, 5–30–72, Cl. D8—154.

Katayama, Isao, assignor to Minolta Camera Kabushiki Kaisha, and Matsushita Electric Industrial Co., fractional part interest to each. Motion picture sound projector-viewer unit. 223,729, 5–30–72, Cl. D61—1.

Kester, Don W. Combined game board and chip holder or the like. 233,714, 5–30–72, Cl. D34—5.

Kirby, Edna M. Glove. 223,695, 5–30–72, Cl. D2—375.

Klupp, George A., Jr. Lamp. 223,720, 5–30–72, Cl. D48—20.
La Barber, Joseph A., to Weiland, Henry. Housing for blower vacuum or similar air circulating device. 223,734, 5–30–72, Cl. D83—901.
Lapointe, Yves A., to Bombardier Ltd. Snowmobile seat. 223,709, 5–30–72, Cl. D14—24.
Lausch, John W. Support for concrete reinforcing rod. 223,701, 5–30–72, Cl. D8—228.
Legere, Alan E. Combined comb and cannister carrier. 223,736, 5–30–72, Cl. D86—10.
Lennox, Clarence R. Snow scooter. 223,715, 5–30–72, Cl. D34—15.
Levin, Henry. Harp. 223,727, 5–30–72, Cl. D56—1.
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Mason, Robert W., to Marathon Equipment & Supply Limited. Roof insulation ventilator. 223,712, 5–30–72, Cl. D23—153.
Matsushita Electric Industrial Co., Ltd.: *See*—
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Matys, Stanley J., to Igniters, Inc. Igniter. 223,711, 5–30–72, Cl. D23—129.
Mayer, Frank & Associates Inc.: *See*—
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McCutcheon, Charles T., and Cole. Snowmobile shelter. 223,705, 5–30–72, Cl. D13—1.
Memorex Corp.: *See*—
Weiss, Reinhold M, and Dennehey. 223,739.
Minolta Camera Kabushiki Kaisha: *See*—
Katayama, Isao. 223,729.
Misenko, Stephen B. Reminder index box. 223,732, 5–30–72, Cl. D74—2.
Morse, John B.: *See*—
Bullock, Edward K., Burke, Conner, Dietz, Morse, and Tilley. 223,730.
Nielsen, Robert B., to Mayer, Frank & Associates, Inc. Cigarette merchandiser. 223,733, 5–30–72, Cl. D80—9.
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Pomper, William R. Razor or similar article. 223,741, 5–30–72, Cl. D95—3.
Reay, Charles P. Game box. 223,713, 5–30–72, Cl. D34—5.
Roughsedge, Ralf F. M. Foldable trap rake. 223,696, 5–30–72, Cl. D8—13.
Salisbury, James. Dolly for supporting helicoper and the like. 233,707, 5–30–72, Cl. D14—3.
Smith, Eva N. Hair spray shield. 223,737, 5–30–72, Cl. D86—10.
Stehouwer, Adrian W. Charcoal fire starter. 223,722, 5–30–72, Cl. D48—27.
Stein, Karl A. Brush. 223,738, 5–30–72, Cl. D86—13.
Steinbach, Thomas M.: *See*—
Hughes, Richard J., and Steinbach. 223,706.
Straus, Albert E., to Perry Plastics, Inc. Suture cutter. 223,735, 5–30–72, Cl. D83—12.
Takagi, Makoto, to Tokyo Seimitsu Co., Ltd. Electronic micrometer. 223,725, 5–30–72, Cl. D52—6.
Thompson, Maxwell O. Distance sight measuring device. 223,723, 5–30–72, Cl. D52—6.
Tilley, Alvin R.: *See*—
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Wallace, Paul H. Water meter dial cover. 223,724, 5–30–72, Cl. D52—6.
Weathershields Ltd.: *See*—
Edwards, Harry. 223,708.
Weiland, Henry: *See*—
La Barber, Joseph A. 223,734.
Weinhold, Hannelore. Tire. 223,740, 5–30–72, Cl. D90—20.
Weiss, Reinhold M., and Dennehey, to Memorex Corp. Storage case for a magnetic tape cassette. 223,739, 5–30–72, Cl. D87—1.
Weissman, Peter, to Consul Gesellschaft mit beschrankter Haftung. Pocket lighter. 223,721, 5–30–72, Cl. D48—27.
Wells, Willis L., to VueTech Corp. Combined rear projection viewer and clock. 233,728, 5–30–72, Cl. D61—1.
Zierhut, Clarence D. Combined typewriter, recording device and enclosure therefor. 223,731, 5–30–72, Cl. D64—11.

LIST OF DESIGN PATENTEES

CLASSIFICATION OF PATENTS

ISSUED MAY 30, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

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88.5	3,665,756
94	3,665,757
140	3,665,758
188	3,665,759
	3,665,760
190R	3,665,762
	3,665,763
190	3,665,761
231	3,665,764
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CLASS 74

29	3,665,771
75	3,665,772
230.17	3,665,781
231R	3,665,773
242.9	3,665,780
325	3,665,774
424.8R	3,665,782
473P	3,665,776
473R	3,665,775
492	3,665,777
	3,665,778
498	3,665,783
501	3,665,784
543	3,665,785
625	3,665,786
674	3,665,787
751	3,665,788
813L	3,665,789
866	3,665,779

CLASS 75

.5BA	3,666,437
.5R	3,666,436
10	3,666,438
49	3,666,439
76	3,666,440
78	3,666,441
84	3,666,442
84.1	3,666,443
84.4	3,666,444
94	3,666,445
101BE	3,666,446
108	3,666,447
122	3,666,448
123E	3,666,452
130B	3,666,449
134H	3,666,450
147	3,666,451
175.5	3,666,453
200	3,666,454
201	3,666,455
208	3,666,456

CLASS 81

43	3,665,790
125	3,665,791

CLASS 83

1	3,665,792
2	3,665,793
156	3,665,796
253	3,665,794
395	3,665,795
411	3,665,797
575	3,665,798

CLASS 84

1.01	3,666,874
1.13	3,666,875
422	3,665,799

CLASS 85

5	3,665,800
41	3,665,801

CLASS 89

1B	3,665,802
7	3,665,803
14C	3,665,804

CLASS 90

14	3,665,805

CLASS 91

35	3,665,807
52	3,665,806
272	3,665,808
363A	3,665,809
420	3,665,810
492	3,665,811

CLASS 92

24	3,665,812
30	3,665,813
71	3,665,814
107	3,665,815
121	3,665,835
168	3,665,816

CLASS 93

61R	3,665,817
81R	3,665,818
	3,665,819

CLASS 94

39	3,665,820
46	3,665,821
50R	3,665,822
	3,665,823

CLASS 95

4.5	3,665,825
10CD	3,665,826
10CT	3,665,824
11R	3,665,828
11.5R	3,665,827
31CA	3,665,829
31FL	3,665,830
39	3,665,831
	3,665,832
44R	3,665,834
53.3	3,665,833

CLASS 96

1R	3,666,458
1.8	3,666,459
29R	3,666,457
29	3,666,460
35.001	3,666,461
36.1	3,666,462
41	3,666,463
45	3,666,465
48	3,666,464
	3,666,466
56	3,666,468
66	3,666,469
75	3,666,467
82	3,666,470
85	3,666,471
88	3,666,472
91D	3,666,473
91	3,666,474
94	Re.27,375
109R	3,666,475
109	3,666,476
114.1	3,666,477
114.5	3,666,478
116	3,666,479
124	3,666,480

CLASS 98

1.5	3,665,836
40DL	3,665,838
40D	3,665,837

CLASS 99

1	3,666,481
30	3,666,482
54	Re.27,381
65	3,666,483
77	3,666,484
88	3,666,485
91	3,666,486
106	3,666,487
107	3,666,488
	3,666,489
108	3,666,490
124	3,666,491
135	3,666,492
139	3,666,493
140R	3,666,494
	3,666,495
	3,666,496
212	3,666,497
216	3,666,498
238.1	3,666,499
238.6	3,665,839
261	3,665,840
281	3,665,841
332	3,665,842
419	3,665,843

CLASS 100

4	3,665,844

27 3,665,845
162 3,665,846
218 3,665,848
231 3,665,847
245 3,665,849

CLASS 101

93C 3,665,850
3,665,852
114 3,665,851
247 3,665,853
269 3,665,854
336 3,665,855
426 3,665,856

CLASS 102

1R 3,665,857
27R 3,665,858
45 3,665,859
70.2 3,665,860
93 3,665,861
103 3,665,862

CLASS 104

25 3,665,863
88 3,665,864
130 3,666,050

CLASS 105

183 3,665,865
369A 3,665,866

CLASS 106

6 3,666,500
14 3,666,501
22 3,666,502
30 3,666,503
38.35 3,666,504
39R 3,666,505
41 3,666,506
44 3,666,507
52 3,666,414
98 3,666,509
181 3,666,510
183 3,666,508
210 3,666,511
213 3,666,512
288B 3,666,513
3,666,514
314 3,666,515

CLASS 108

25 3,665,867
29 3,665,868
53 3,665,869

CLASS 110

1A 3,665,870
8C 3,665,871

CLASS 112

67 3,665,872
79A 3,665,873
118 3,665,874
218A 3,665,875
219A 3,665,876
235 3,665,877
252 3,665,878
265 3,665,879
417 3,665,880

CLASS 113

119 3,665,881

CLASS 114

.5F 3,665,882
16E 3,665,883
3,665,884
61 3,665,885
73 3,665,886
221 3,665,887

CLASS 117

3.4 3,666,516
5.3 3,666,531
7 3,666,517
17.5 3,666,518
3,666,519
22 3,666,520
26 3,666,521
33 3,666,522
3,666,523
36.4 3,666,524
36.8 3,666,525
46CB 3,666,526
47A 3,666,527
49 3,666,528
50 3,666,529
54 3,666,530
76F 3,666,532
93.1GD 3,666,533
97 3,666,534
98 3,666,535
106R 3,666,536
114R 3,666,537
121 3,666,538
124F 3,666,539
129 3,666,540
132CF 3,666,541
135.5 3,666,542
136 3,666,543
137 3,666,544
138.8F 3,666,545
201 3,666,546
212 3,666,547
3,666,548
3,666,549
217 3,666,550
218 3,666,551
227 3,666,552
228 3,666,555
229 3,666,553
230 3,666,554

CLASS 118

58 3,665,888
412 3,665,890
505 3,665,889
637 3,665,891

CLASS 119

29 3,665,892

CLASS 122

6A 3,665,893
374 3,665,894
406ST 3,665,895

CLASS 123

18A 3,665,896
25B 3,665,897
32EA 3,665,898
3,665,899
3,665,900
3,665,901
32ST 3,665,902
102 3,665,903
117A 3,665,904
119C 3,665,905
136 3,665,906
139E 3,665,907
148E 3,665,908

CLASS 124

9 3,665,909
11 3,665,910
24 3,665,911

CLASS 125

11AT 3,665,912

CLASS 126

25R 3,665,913
41R 3,665,914
200 3,665,915

CLASS 127

7 3,666,556
32 3,666,557

CLASS 128

2R 3,665,916
3,665,917
156 3,665,918
277 3,665,919
287 3,665,920
3,665,921
290W 3,665,923
290 3,665,922
305 3,665,924
323 3,665,925
326 3,665,926
335.5 3,665,927
350R 3,665,928
494 3,665,929

CLASS 131

21R 3,665,930
3,665,931
3,665,932
25 3,665,933
183 3,665,934

CLASS 132

7 3,665,935
9 3,665,936
11 3,665,937
33R 3,665,938
3,665,939
53 3,665,940

CLASS 134

1 3,666,558
3 3,666,559
58R 3,665,941
167R 3,665,942
200 3,665,943

CLASS 135

1R 3,665,944

CLASS 136

6 3,666,560
86B 3,666,562
86R 3,666,561
120FC 3,666,563
3,666,565
170 3,666,564
202 3,666,566

CLASS 137

14 3,665,945
68 3,665,946
81.5 3,665,947
3,665,948
3,665,949
107 3,665,950
117 3,665,951
246 3,665,952
246.22 3,665,953
268 3,665,954
495 3,665,955
505.11 3,665,956
509 3,665,957
522 3,665,958
551 3,665,959
3,665,960
608 3,665,961
624.13 3,665,962
625.48 3,665,963
630.13 3,665,964

CLASS 138

39 Re.27,378
42 3,665,965
93 3,665,966
137 3,665,967
141 3,665,968
178 3,665,969

CLASS 139

20 3,665,970
33 3,665,971
68 3,665,972
71 3,665,973
126 3,665,976
127P 3,665,974
127R 3,665,975
387 3,665,977

CLASS 140

93A 3,665,978
93.4 3,665,979

CLASS 141

183 3,665,980
329 3,665,981

CLASS 143

6H 3,665,982
68F 3,665,983
137R 3,665,984

CLASS 144

34E 3,665,985
288A 3,665,989
288 3,665,986

CLASS 146

81R 3,665,987
227 3,665,988

CLASS 148

1.5 3,666,567
6.2 3,666,568
12 3,666,569
36 3,666,570
104 3,666,571
134 3,666,572
175 3,666,573
188 3,666,574

CLASS 149

19 3,666,575
3,666,576
89 3,666,577

CLASS 150

52R 3,665,990
3,665,991

CLASS 152

208 3,665,992
356 3,665,993
359 3,665,994

CLASS 156

3 3,666,578
16 3,666,579
18 3,666,580
39 3,666,581
63 3,666,582
82 3,666,583
84 3,666,584
85 3,666,585
98 3,666,586
155 3,666,588
172 3,666,589
199 3,666,587
210 3,666,590
272 3,666,591
285 3,666,592
3,666,593
291 3,666,594
305 3,666,597
324 3,666,595
344 3,666,596
361 3,666,598
380 3,666,599
382 3,666,600
527 3,666,601
580 3,666,602
583 3,666,603

CLASS 157

1.1 3,665,995

CLASS 160

1 3,665,996
41 3,665,997

CLASS 161

2 3,666,604
3.5 3,666,605
37 3,666,606
44 3,666,607
62 3,666,608
109 3,666,609
113 3,666,610
147 3,666,611
165 3,666,612
168 3,666,613
183 3,666,614
185 3,666,615
186 3,666,617
235 3,666,618

CLASS 162

30 3,666,619
76 3,666,620
198 3,666,621

CLASS 164

76 3,665,998
283 3,665,999

CLASS 165

8 3,666,000
19 3,666,004
29 3,666,002
39 3,666,003
105 3,666,005
164 3,666,006
166 3,666,007
177 3,666,008

CLASS 166

.5 3,666,009
134 3,666,010
187 3,666,011
224 3,666,012
241 3,666,013
271 3,666,014

CLASS 169

5 3,666,015
31R 3,666,016

CLASS 171

27 3,666,017

CLASS 172

130 3,666,019
612 3,666,020
669 3,666,018

CLASS 173

12 3,666,021
80 3,666,022
93.5 3,666,023
105 3,666,024
112 3,666,025
152 3,666,026
169 3,666,027

CLASS 174

36 3,666,876
115 3,666,877
128 3,666,879
152R 3,666,878

CLASS 175

4.56 3,666,030
189 3,666,028
374 3,666,029

CLASS 176

38 3,666,616
3,666,622
60 3,666,623
64 3,666,624
68 3,666,625
86 3,666,626

CLASS 177

142 3,666,031
256 3,666,032

CLASS 178

5.2R 3,666,880
5.4BD 3,666,881
5.4TC 3,666,882
6.6P 3,666,883
6.8 3,666,884
3,666,885
7.8 3,666,886
7.85 3,666,887
69.5TV 3,666,888

CLASS 179

15AP 3,666,890
15BM 3,666,889
18ET 3,666,891
77 3,666,892
100.2D 3,666,893
100.2T 3,666,894
3,666,897
100.3D 3,666,895
100.4R 3,666,896
180 3,666,898

CLASS 180

6.48 3,666,033
3,666,034
25A 3,666,035
43R 3,666,036
64A 3,666,037
66B 3,666,038
105E 3,666,039

CLASS 181

31B 3,666,041
31R 3,666,040
33HA 3,666,043
33E 3,666,044
33K 3,666,042

CLASS 182

20 3,666,045
145 3,666,046
185 3,666,047

CLASS 184

6.26 3,666,049
7E 3,666,048

CLASS 187

1 3,666,051
8.5 3,666,053
9 3,666,052
10 3,666,054

CLASS 188

1B 3,666,056
3,666,057
1C 3,666,055
106A 3,666,058
106R 3,666,059
112 3,666,060
206R 3,666,061

CLASS 192

21 3,666,063
70.28 3,666,062
84PM 3,666,064
103A 3,666,065

CLASS 193

43B 3,666,066

CLASS 194

58 3,666,068
497.022 3,666,067

CLASS 195

68 3,666,627
80R 3,666,628
81 3,666,630
127 3,666,629
3,666,631

CLASS 197

6.2 3,666,072
16 3,666,069
18 3,666,070
60 3,666,071

CLASS 198

1 3,666,073
3,666,076
16R 3,666,074
3,666,075
29 3,666,077
33AA 3,666,079
33AD 3,666,078
38 3,666,080
43 3,666,081
130 3,666,082
136 3,666,083
160 3,666,084
193 3,666,085
219 3,666,086

CLASS 200

5E 3,666,899
6A 3,666,900
42T 3,666,901
61.05 3,666,903
153S 3,666,902

CLASS 203

56 3,666,632
95 3,666,633

CLASS 204

15 3,666,634
3,666,635
16 3,666,636
30 3,666,637
35N 3,666,638
38C 3,666,639
44 3,666,640
67 Re.27,383
141 3,666,642
141.9 3,666,641
158HA 3,666,644
158R 3,666,643
159.22 3,666,645
160.1 3,666,646
180P 3,666,647
180R 3,666,648
181 3,666,649
195G 3,666,651
195P 3,666,650
195R 3,666,652
243R 3,666,653
3,666,654
299 3,666,655

CLASS 206

45.34 3,666,087
46L 3,666,088
52W 3,666,089
56AB 3,666,090

CLASS 208

48AA 3,666,656
58 3,666,657
103 3,666,658
208R 3,666,659
243 3,666,660

CLASS 209

12 3,666,091
73 3,666,092
74 3,666,093
111.5 3,666,094
169 Re.27,380
254 3,666,095
259 3,666,096

CLASS 210

49 3,666,663
58 3,666,664
82 3,666,097
83 3,666,098
3,666,099
3,666,100
90 3,666,101
138 3,666,102
152 3,666,103
164 3,666,104
198 3,666,105
201 3,666,106
238 3,666,107
305 3,666,108
321 3,666,109
469 3,666,110
521 3,666,111
3,666,112

CLASS 211

26 3,666,113
49R 3,666,114
50 3,666,115

CLASS 214

16.1ED 3,666,116
17D 3,666,117
38B 3,666,118
41 3,666,119
77P 3,666,121
3,666,123
77R 3,666,122
90R 3,666,120
138 3,666,124
141 3,666,125
302 3,666,126
512 3,666,127
514 3,666,128
515 3,666,129
621 3,666,130
3,666,131

CLASS 219

10.55 3,666,904
3,666,905
22 3,666,915
73 3,666,908
76 3,666,906
3,666,909
85 3,666,907
107 3,666,910
117 3,666,911
3,666,912
118 3,666,913
214 3,666,914
3,666,915
286 3,666,916
292 3,666,917
314 3,666,918
421 3,666,919
449 3,666,920
469 3,666,922
492 3,666,921
499 3,666,923
552 3,666,924

CLASS 220

9LG 3,666,132
15 3,666,133
31R 3,666,134
36 3,666,135
39R 3,666,136
3,666,137
53 3,666,138
855 3,666,139

CLASS 221

46 3,666,140

CLASS 222

1 3,666,141
16 3,666,142
61 3,666,143
70 3,666,144
107 3,666,145
132 3,666,146
309 3,666,147
396 3,666,148
453 3,666,150

CLASS 223

85 3,666,149

CLASS 225

2 3,666,151

CLASS 226

50 3,666,152
111 3,666,156
178 3,666,153
195 3,666,154

CLASS 227
110 3,666,155
131 3,666,157

CLASS 228
3 3,666,160
12 3,666,161
25 3,666,158
49 3,666,159

CLASS 229
1.5B 3,666,162
14B 3,666,163
23AB 3,666,166
23R 3,666,164
3,666,165
37R 3,666,167
40 3,666,168

CLASS 232
43.2 3,666,169

CLASS 233
1A 3,666,170
26 3,666,171

CLASS 234
19 3,666,172

CLASS 235
61PC 3,666,927
61.11A 3,666,925
61.12R 3,666,926
92FL 3,666,928
150.22 3,666,929
151.11 3,666,930
151.12 3,666,931
3,666,932
194 3,666,933

CLASS 236
15A 3,666,173

CLASS 237
2R 3,666,174

CLASS 238
152 3,666,175

CLASS 239
2R 3,666,176
77 3,666,177
3,666,178
206 3,666,181
327 3,666,182
463 3,666,183
512 3,666,184
587 3,666,179

CLASS 240
1.2 3,666,935
2 3,666,936
3 3,666,934
6.4 3,666,937
41.15 3,666,180
3,666,939
52.15 3,666,938
90 3,666,940

CLASS 241
17 3,666,185
45 3,666,186
90 3,666,187
213 3,666,188

CLASS 242
7.21 3,666,189
3,666,190
18R 3,666,191
55.19A 3,666,192
68.3 3,666,193
72 3,666,194
75.2 3,666,195
78 3,666,196
84.1R 3,666,197
107.4 3,666,198
149 3,666,199
163 3,666,200
180 3,666,201
182 3,666,202
188 3,666,203
189 3,666,204
192 3,666,205
3,666,206
197 3,666,207
198 3,666,208

CLASS 244
7C 3,666,209
43 3,666,210
54 3,666,211
62 3,666,212
77D 3,666,213
118P 3,666,214
122AB 3,666,215
137 3,666,216

CLASS 246
34CT 3,666,217

CLASS 248
4 3,666,218
15 3,666,219
52 3,666,220
96 3,666,221
146 3,666,222
149 3,666,223
203 3,666,224
205A 3,666,225
214 3,666,226
228 3,666,227
250 3,666,228

CLASS 249
66 3,666,229

CLASS 250
43.5R 3,666,941
3,666,942
51.5 3,666,943
65R 3,666,944
71R 3,666,945
3,666,946
83R 3,666,947
3,666,948
83.1 3,666,950
83.3H 3,666,949
83.3R 3,666,952
3,666,953
83.6FT 3,666,954
106T 3,666,955
199 3,666,956
213VT 3,666,957
219DF 3,666,951

CLASS 251
63.5 3,666,230
129 3,666,231
3,666,232
151 3,666,233
3,666,234
205 3,666,235
306 3,666,236
367 3,666,237

CLASS 252
8.9 3,666,661
33.6 3,666,662
62.9 3,666,665
3,666,666
87 3,666,667
90 3,666,668
132 3,666,669
160 3,666,670
173 3,666,671
188 3,666,672
301.1R 3,666,674
301.1W 3,666,673
301.2R 3,666,675
301.4R 3,666,676
301.6S 3,666,677
316 3,666,678
3,666,679
3,666,680
358 3,666,681
373 3,666,682
408 3,666,683
415 3,666,684
429 3,666,686
432 3,666,685
439 3,666,687
503 3,666,688
512 3,666,689
547 3,666,690

CLASS 254
131.5 3,666,238
175.5 3,666,239

CLASS 259
3 3,666,240
6 3,666,241
8 3,666,242
107 3,666,243
148 3,666,244

CLASS 260
2.3 3,666,691
2.5AJ 3,666,692
2.5R 3,666,693
7 3,666,694
18PN 3,666,695
18TN 3,666,696
22CB 3,666,697
22M 3,666,698
23S 3,666,699
27 3,666,701
28.5D 3,666,700
29.2EP 3,666,702
29.3 3,666,703
29.6AN 3,666,705
29.6WB 3,666,704
29.6XA 3,666,706
32.6N 3,666,708
33.2 3,666,707
33.4P 3,666,709
33.6UA 3,666,710
38 3,666,711
45.7P 3,666,712
3,666,714
45.8A 3,666,713
45.8N 3,666,715
45.9R 3,666,716
45.95 3,666,717
46.5P 3,666,718
47EC 3,666,721
47UA 3,666,720
47XA 3,666,719
49 3,666,722
55.05A Re.27,377
65 3,666,723
75NK 3,666,724
75NT 3,666,725
77.5BB 3,666,727
77.5CH 3,666,726
3,666,728
78S 3,666,731
78.4EP 3,666,729
78.5BB 3,666,732
78.5B 3,666,730
80.3N 3,666,733
87.5D 3,666,734
87.5R 3,666,735
88.2R 3,666,736
91.3VA 3,666,738
3,666,739
91.3R 3,666,740
92.1 3,666,741
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Peter G. Peterson, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*